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L4 3811 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)P(L)O(L)(TI OR V
OR CR OR MN OR FE OR CO OR NI OR CU OR ZR OR NB OR MO OR
RU OR AG OR TA OR W OR PT OR AU)/ELS
L7 521 SEA FILE=REGISTRY ABB=ON PLU=ON L4 AND 2-7/LI
L9 3102 SEA FILE=REGISTRY ABB=ON PLU=ON L4 AND 3.5-8/O
L10 2942 SEA FILE=REGISTRY ABB=ON PLU=ON L9 AND 0.01-1/M
L11 476 SEA FILE=REGISTRY ABB=ON PLU=ON L7 AND L9 AND L10
L21 473 SEA FILE=REGISTRY ABB=ON PLU=ON L11 AND TIS/CI
L22 210 SEA FILE=HCAPLUS ABB=ON PLU=ON L21
L24 117 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 AND ELECTROCHEM?/SC, SX
L25 59 SEA FILE=HCAPLUS ABB=ON PLU=ON L24 AND (1840-2003)/PRY, AY
, PY

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E52 THROUGH E232 ASSIGNED

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L25 ANSWER 1 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:41410 HCAPLUS Full-text
DOCUMENT NUMBER: 146:145947
TITLE: Novel electrode active material for a secondary
electrochemical cell
INVENTOR(S): Barker, Jeremy; Burns, Paul; Bryan, Aiden; Grover,
Richard
PATENT ASSIGNEE(S): UK
SOURCE: U.S. Pat. Appl. Publ., 17pp., Cont.-in-part of
U.S. Ser. No. 870,135.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 4
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070009800	A1	20070111	US 2006-531824 ----- <--	20060914
US 6387568	B1	20020514	US 2000-559861 ----- <--	20000427
US 20030027049	A1	20030206	US 2001-14822 ----- <--	20011026
US 6777132	B2	20040817		
US 20040265695	A1	20041230	US 2004-870135 ----- <--	20040616
US 7214448	B2	20070508		
WO 2008033672	A2	20080320	WO 2007-US77173	20070830
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,				

IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
 TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
 ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: US 2000-559861 A2 20000427
 <--
 US 2001-14822 A3 20011026
 <--
 US 2004-870135 A2 20040616
 US 2006-531824 A 20060914

ED Entered STN: 12 Jan 2007

AB The invention provides a novel polyanion-based electrode active material for use in a secondary or rechargeable electrochem. cell having a first electrode, a second electrode and an electrolyte.

IT 918961-43-0P, Iron lithium fluoride phosphate
 $(FeLi_2F_1.3(PO_4)0.9)$ 918961-45-2P 918961-47-4P
 (electrode active material for secondary electrochem. cell)

RN 918961-43-0 HCPLUS

CN Iron lithium fluoride phosphate (FeLi₂F_{1.3}(PO₄)0.9) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1.3	14762-94-8
O ₄ P	0.9	14265-44-2
Li	2	7439-93-2
Fe	1	7439-89-6

RN 918961-45-2 HCPLUS

CN Iron lithium magnesium fluoride phosphate
 $(Fe_0.95Li_2Mg_0.05F_2.2(PO_4)0.6)$ (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	2.2	14762-94-8
O ₄ P	0.6	14265-44-2
Mg	0.05	7439-95-4
Li	2	7439-93-2
Fe	0.95	7439-89-6

RN 918961-47-4 HCPLUS

CN Iron lithium manganese hydroxide phosphate
 $(Fe_0.2Li_2Mn_0.8(OH)_1.6(PO_4)0.8)$ (CA INDEX NAME)

Component	Ratio	Component Registry Number
HO	1.6	14280-30-9
O ₄ P	0.8	14265-44-2
Mn	0.8	7439-96-5
Li	2	7439-93-2
Fe	0.2	7439-89-6

INCL 429231900; 429231950; 429221000; 429231500; 429224000; 429220000;
 429225000; 429223000; 429217000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

Section cross-reference(s): 49
 IT 918961-43-0P, Iron lithium fluoride phosphate
 (FeLi2F1.3(P04)0.9) 918961-44-1P, Sodium vanadium hydroxide
 phosphate (NaV(OH)1.3(P04)0.9) 918961-45-2P 918961-46-3P,
 Sodium vanadium chloride phosphate (NaVC11.6(P04)0.8)
 918961-47-4P 918961-48-5P, Iron lithium fluoride silicate
 (FeLi2F1.2(SiO4)0.9) 918961-49-6P, Lithium vanadium fluoride
 phosphate (LiVF1.3(P04)0.9)
 (electrode active material for secondary electrochem. cell)

L25 ANSWER 2 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2005545195 HCPLUS Full-text
 DOCUMENT NUMBER: 143:81020
 TITLE: Lithium battery showing both high electric
 potential and lithium intercalation capacity.
 INVENTOR(S): Jouanneau-Si Larbi, Severine; Le Cras, Frederic;
 Bourbon, Carole; Gauthier, Gilles
 PATENT ASSIGNEE(S): Commissariat a l'Energie Atomique, Fr.
 SOURCE: Eur. Pat. Appl., 6 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: French
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1544930	A2	20050622	EP 2004-354039	20041202 -->
EP 1544930	A3	20070725		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
FR 2864348	A1	20050624	FR 2003-14865	20031218 -->
FR 2864348	B1	20060310		
US 20050136331	A1	20050623	US 2004-998985	20041130 -->
JP 2005183395	A	20050707	JP 2004-368132	20041220 -->
CN 1641915	A	20050720	CN 2004-10102151	20041220 -->
PRIORITY APPLN. INFO.:			FR 2003-14865	A 20031218 -->

ED Entered STN: 24 Jun 2005

AB A lithium battery consists of at least one first electrode consisting of active material into which the Li⁺ cations are able to be inserted, a second electrode, and an electrolyte. The active material in the first electrode consists of a condensed linear composition possessing at least two tetrahedra, resp. of type A04 and A'04, linked by one common oxygen. An ion M2+ of a transition metal of oxidation state +2 and chosen from between Ni2+, Co2+, Mn2+, Fe2+, and Ti2+ is inserted into the condensed linear composition and the ratio between the number of Li⁺ cations which can be inserted into the active material and the number of transition metal M2+ ions is strictly greater than 1. A and A' are chosen from between P5+, Si4+, Al3+, S6+, Ge4+, and B3+. One possible active material is LiaXbMzd(A207)e(A'03)f, where X represents at least one alkali metal at an oxidation state of 1+ chosen from among Li⁺, Na⁺, K⁺, and M represents at least one transition metal of oxidation state 2+ chosen from among Ni2+, Co2+, Mn2+, Fe2+, and Ti2+, and Z represents at least one transition metal chosen from the group Cu⁺, Ag⁺, Mg2+, Ca2+, Sr2+, Zn2+,

V₂₊, Cu₂₊, Al₃₊, Ti₃₊, Cr₃₊, Fe₃₊, Mn₃₊, Ga₃₊, V₃₊, Ge₃₊, Sn₃₊, Mo₃₊, Ti₄₊, V₄₊, V₅₊, Ta₅₊, Nb₅₊ and Mo₆₊, the chemical elements O, S, F, and Cl, and a grouping of type AⁿO_d, and a>1 and b and d>0, and at least e or f>0. A" is a cation chosen from P₅₊, Si₄₊, Al₃₊, S₆₊, Ge₄₊, B₃₊.

IT 855205-84-4P
 (carbon supported; lithium battery showing both high elec.
 potential and lithium intercalation capacity)

RN 855205-84-4 HCPLUS

CN Lithium nickel (diphosphate) metaphosphate (Li₃Ni(P₂₀₇)(PO₃)₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₃ P	2	15389-19-2
O ₇ P ₂	1	14000-31-8
Ni	1	7440-02-0
Li	3	7439-93-2

IT 855205-80-0P, Lithium nickel (diphosphate) phosphate
 (Li₄Ni₃(P₂₀₇)(PO₄)₂)
 (plain and carbon-supported; lithium battery showing both high
 elec. potential and lithium intercalation capacity)

RN 855205-80-0 HCPLUS

CN Lithium nickel (diphosphate) phosphate (Li₄Ni₃(P₂₀₇)(PO₄)₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ P	2	14265-44-2
O ₇ P ₂	1	14000-31-8
Ni	3	7440-02-0
Li	4	7439-93-2

IC ICM H01M004-50
 ICS H01M004-52

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

Section cross-reference(s): 49

IT 855205-84-4P
 (carbon supported; lithium battery showing both high elec.
 potential and lithium intercalation capacity)

IT 855205-80-0P, Lithium nickel (diphosphate) phosphate

(Li₄Ni₃(P₂₀₇)(PO₄)₂)
 (plain and carbon-supported; lithium battery showing both high
 elec. potential and lithium intercalation capacity)

L25 ANSWER 3 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:283979 HCPLUS Full-text

DOCUMENT NUMBER: 142:358045

TITLE: Rechargeable lithium battery

INVENTOR(S): Hwang, Duck-Chul; Hwang, Seung-Sik; Lee,
 Sang-Mock; Cho, Chung-Kun; Choi, Yun-Suk

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 21 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050069775	A1	20050331	US 2004-933384 -->	20040903
KR 2005030440	A	20050330	KR 2003-66900 -->	20030926
JP 2005108810	A	20050421	JP 2004-210601 -->	20040716
CN 1601798	A	20050330	CN 2004-10082666 -->	20040927

PRIORITY APPLN. INFO.:

KR 2003-66900	A	20030926 -->
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ED Entered STN: 03 Apr 2005

AB A rechargeable lithium battery includes a pos. electrode having a pos. active material to reversibly intercalate and deintercalate lithium ions, a neg. electrode having a neg. active material, and an electrolyte, wherein an arithmetic mean Ra of a surface roughness of the pos. electrode is 155 to 419 nm, and an arithmetic mean Ra of a surface roughness of the neg. electrode is 183 to 1159 nm after the rechargeable lithium battery is charged and discharged.

IT 329025-35-6, Iron lithium phosphate (Fe2Li1-3(PO4)3)
(rechargeable lithium battery)

RN 329025-35-6 HCPLUS

CN Iron lithium phosphate (Fe2Li1-3(PO4)3) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
Li	1 - 3	7439-93-2
Fe	2	7439-89-6

IC ICM H01M004-58

ICS H01M004-48; H01M004-50; H01M004-52

INCL 429231950; 429223000; 429231100; 429231200; 429224000; 429218100;
429231300; 429231000; 429220000; 429221000CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 623-53-0,
Ethyl methyl carbonate 1314-62-1, Vanadium oxide (V2O5), uses
12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium
manganese oxide (LiMn2O4) 12162-79-7, Lithium manganese oxide limno2
12162-92-4, Lithium vanadium oxide (LiV2O5) 12190-79-3, Cobalt
lithium oxide (CoLiO2) 13568-36-0, Lithium nickel vanadium oxide
(LiNiVO4) 21324-40-3, Lithium hexafluorophosphate 179802-95-0,
Cobalt lithium manganese nickel oxide (Co0.1LiMn0.1Ni0.8O2)
329025-35-6, Iron lithium phosphate (Fe2Li1-3(PO4)3)
(rechargeable lithium battery)

L25 ANSWER 4 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:906086 HCPLUS [Full-text](#)

DOCUMENT NUMBER: 1411:382165

TITLE: Solid electrolyte and total solid secondary
battery containing the electrolyteINVENTOR(S): Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki;
Ito, ShujiPATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: PCT Int. Appl., 41 pp.

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004093236	A1	20041028	WO 2004-JP5424	20040415
<--				
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
<--				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004335455	A	20041125	JP 2004-119042	20040414
<--				
JP 3690684	B2	20050831		
EP 1630893	A1	20060301	EP 2004-727754	20040415
<--				
R: DE, FR, GB				
CN 1751409	A	20060322	CN 2004-80004511	20040415
<--				
US 20060216611	A1	20060928	US 2005-551935	20051004
<--				
PRIORITY APPLN. INFO.:			JP 2003-113850	A 20030418
			<--	
			WO 2004-JP5424	W 20040415

ED Entered STN: 29 Oct 2004

AB The electrolyte, comprising Li, O, P and a transition metal element, is represented by LixSTyOz ($T = \text{transition metal}$; $x = 2-7$; $y = 0.01-1$; and $z = 3.5-8$). The battery has the above electrolyte between a cathode and an anode.

IT 782495-70-9, Lithium tungsten oxide phosphate
 (Li₃.2W₀.100.4(PO₄)) 782495-72-1, Lithium tungsten oxide phosphate (Li₃.66W₀.33O₁.32(PO₄))

(solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

RN 782495-70-9 HCAPLUS

CN Lithium tungsten oxide phosphate (Li₃.2W₀.100.4(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====		
O	0.4	17778-80-2
O ₄ P	1	14265-44-2
W	0.1	7440-33-7
Li	3.2	7439-93-2

RN 782495-72-1 HCAPLUS

CN Lithium tungsten oxide phosphate (Li₃.66W₀.33O₁.32(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.32	17778-80-2
O4P	1	14265-44-2
W	0.33	7440-33-7
Li	3.66	7439-93-2
IT	782495-67-4, Lithium tungsten oxide phosphate (Li3.5W0.250(PO4)) (solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)	
RN	782495-67-4 HCPLUS	
CN	Lithium tungsten oxide phosphate (Li3.5W0.250(PO4)) (CA INDEX NAME)	
Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
W	0.25	7440-33-7
Li	3.5	7439-93-2
IT	782495-23-2, Lithium titanium metaphosphate oxide (Li2.8Ti0.2(PO3)00.9) 782495-24-3, Lithium vanadium metaphosphate oxide (Li2.8V0.2(PO3)00.9) 782495-25-4, Chromium lithium metaphosphate oxide (Cr0.2Li2.8(PO3)00.9) 782495-26-5, Lithium manganese metaphosphate oxide (Li2.8Mn0.2(PO3)00.9) 782495-27-6, Iron lithium metaphosphate oxide (Fe0.2Li2.8(PO3)00.9) 782495-28-7, Cobalt lithium metaphosphate oxide (Co0.2Li2.8(PO3)00.9) 782495-29-8, Lithium nickel metaphosphate oxide (Li2.8Ni0.2(PO3)00.9) 782495-30-1, Copper lithium metaphosphate oxide (Cu0.2Li2.8(PO3)00.9) 782495-31-2, Lithium zirconium metaphosphate oxide (Li2.8Zr0.2(PO3)00.9) 782495-32-3, Lithium niobium metaphosphate oxide (Li2.8Nb0.2(PO3)00.9) 782495-33-4, Lithium molybdenum metaphosphate oxide (Li2.8Mo0.2(PO3)00.9) 782495-34-5, Lithium ruthenium metaphosphate oxide (Li2.8Ru0.2(PO3)00.9) 782495-35-6, Lithium silver metaphosphate oxide (Li2.8Ag0.2(PO3)00.9) 782495-36-7, Lithium tantalum metaphosphate oxide (Li2.8Ta0.2(PO3)00.9) 782495-37-8, Lithium tungsten metaphosphate oxide (Li2.8W0.2(PO3)00.9) 782495-38-9, Lithium platinum metaphosphate oxide (Li2.8Pt0.2(PO3)00.9) 782495-39-0, Gold lithium metaphosphate oxide (Au0.2Li2.8(PO3)00.9) 782495-41-4, Lithium tungsten metaphosphate oxide (Li2.8W0.01(PO3)00.9) 782495-42-5, Lithium tungsten metaphosphate oxide (Li2.8W0.05(PO3)00.9) 782495-43-6, Lithium tungsten metaphosphate oxide (Li2.8W0.1(PO3)00.9) 782495-44-7, Lithium tungsten metaphosphate oxide (Li2.8W0.5(PO3)00.9) 782495-45-8, Lithium tungsten metaphosphate oxide (Li2.8W0.52(PO3)00.9) 782495-46-9, Lithium tungsten metaphosphate oxide (Li2.8W0.6(PO3)00.9) 782495-47-0, Lithium vanadium oxide phosphate (Li2.8V0.200.4(PO4)) 782495-48-1, Chromium lithium oxide phosphate (Cr0.2Li2.800.2(PO4)) 782495-49-2, Lithium manganese oxide phosphate (Li2.8Mn0.200.3(PO4)) 782495-50-5, Iron lithium oxide phosphate (Fe0.2Li2.800.17(PO4)) 782495-51-6, Cobalt lithium oxide phosphate (Co0.2Li2.800.17(PO4)) 782495-52-7,	

Lithium nickel oxide phosphate (Li_{2.8}NiO₂0.1(PO₄)) 782495-53-8, Copper lithium oxide phosphate (CuO·2Li₂800.1(PO₄)) 782495-54-9, Lithium zirconium oxide phosphate (Li_{2.8}ZrO₂0.200.3(PO₄)) 782495-55-0, Lithium niobium oxide phosphate (Li_{2.8}NbO₂0.200.4(PO₄)) 782495-56-1, Lithium molybdenum oxide phosphate (Li_{2.8}MoO₂0.200.5(PO₄)) 782495-57-2, Lithium silver phosphate (Li_{2.8}AgO₂(PO₄)) 782495-58-3, Lithium tantalum oxide phosphate (Li_{2.8}TaO₂0.200.4(PO₄)) 782495-59-4, Lithium tungsten oxide phosphate (Li_{2.8}WO₂0.200.5(PO₄)) 782495-60-7, Lithium titanium oxide phosphate (Li₄TiO_{2.250}(PO₄)) 782495-61-8, Lithium vanadium oxide phosphate (Li_{3.75}V_{0.250}(PO₄)) 782495-62-9, Chromium lithium oxide phosphate (Cr_{0.25}Li_{3.50}(PO₄)) 782495-63-0, Lithium manganese oxide phosphate (Li_{3.25}MnO_{2.250}(PO₄)) 782495-64-1, Lithium niobium oxide phosphate (Li_{3.75}NbO_{2.250}(PO₄)) 782495-65-2, Lithium molybdenum oxide phosphate (Li_{3.5}MoO_{2.250}(PO₄)) 782495-66-3, Lithium tantalum oxide phosphate (Li_{3.75}TaO_{2.250}(PO₄)) 782495-69-6, Lithium tungsten oxide phosphate (Li_{3.02}W_{0.010.04}(PO₄)) 782495-74-3, Lithium tungsten oxide phosphate (Li₅WO₄(PO₄)) 782495-76-5, Lithium tungsten oxide phosphate (Li₇W₂O₈(PO₄)) (solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

RN 782495-23-2 HCPLUS

CN Lithium titanium metaphosphate oxide (Li_{2.8}TiO₂(PO₃)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Ti	0.2	7440-32-6
Li	2.8	7439-93-2

RN 782495-24-3 HCPLUS

CN Lithium vanadium metaphosphate oxide (Li_{2.8}V_{0.2}(PO₃)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
V	0.2	7440-62-2
Li	2.8	7439-93-2

RN 782495-25-4 HCPLUS

CN Chromium lithium metaphosphate oxide (Cr_{0.2}Li_{2.8}(PO₃)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Cr	0.2	7440-47-3
Li	2.8	7439-93-2

RN 782495-26-5 HCPLUS

10/551,935

CN Lithium manganese metaphosphate oxide ($\text{Li}_{2.8}\text{Mn}_{0.2}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Mn	0.2	7439-96-5
Li	2.8	7439-93-2

RN 782495-27-6 HCPLUS

CN Iron lithium metaphosphate oxide ($\text{Fe}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Li	2.8	7439-93-2
Fe	0.2	7439-89-6

RN 782495-28-7 HCPLUS

CN Cobalt lithium metaphosphate oxide ($\text{Co}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Co	0.2	7440-48-4
Li	2.8	7439-93-2

RN 782495-29-8 HCPLUS

CN Lithium nickel metaphosphate oxide ($\text{Li}_{2.8}\text{Ni}_{0.2}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Ni	0.2	7440-02-0
Li	2.8	7439-93-2

RN 782495-30-1 HCPLUS

CN Copper lithium metaphosphate oxide ($\text{Cu}_{0.2}\text{Li}_{2.8}(\text{PO}_3)_{00.9}$) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Cu	0.2	7440-50-8
Li	2.8	7439-93-2

RN 782495-31-2 HCPLUS

10/551,935

CN Lithium zirconium metaphosphate oxide (Li_{2.8}Zr_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Zr	0.2	7440-67-7
Li	2.8	7439-93-2

RN 782495-32-3 HCAPLUS

CN Lithium niobium metaphosphate oxide (Li_{2.8}Nb_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Nb	0.2	7440-03-1
Li	2.8	7439-93-2

RN 782495-33-4 HCAPLUS

CN Lithium molybdenum metaphosphate oxide (Li_{2.8}Mo_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Mo	0.2	7439-98-7
Li	2.8	7439-93-2

RN 782495-34-5 HCAPLUS

CN Lithium ruthenium metaphosphate oxide (Li_{2.8}Ru_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Ru	0.2	7440-18-8
Li	2.8	7439-93-2

RN 782495-35-6 HCAPLUS

CN Lithium silver metaphosphate oxide (Li_{2.8}Ag_{0.2}(PO₃)_{0.9}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Ag	0.2	7440-22-4
Li	2.8	7439-93-2

RN 782495-36-7 HCAPLUS

10/551,935

CN Lithium tantalum metaphosphate oxide (Li_{2.8}Ta_{0.2}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Ta	0.2	7440-25-7
Li	2.8	7439-93-2

RN 782495-37-8 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.2}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.2	7440-33-7
Li	2.8	7439-93-2

RN 782495-38-9 HCAPLUS

CN Lithium platinum metaphosphate oxide (Li_{2.8}Pt_{0.2}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Pt	0.2	7440-06-4
Li	2.8	7439-93-2

RN 782495-39-0 HCAPLUS

CN Gold lithium metaphosphate oxide (Au_{0.2}Li_{2.8}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
Au	0.2	7440-57-5
Li	2.8	7439-93-2

RN 782495-41-4 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.01}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.01	7440-33-7
Li	2.8	7439-93-2

RN 782495-42-5 HCAPLUS

10/551,935

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.05}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.05	7440-33-7
Li	2.8	7439-93-2

RN 782495-43-6 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.1}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.1	7440-33-7
Li	2.8	7439-93-2

RN 782495-44-7 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.5}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.5	7440-33-7
Li	2.8	7439-93-2

RN 782495-45-8 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.52}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.52	7440-33-7
Li	2.8	7439-93-2

RN 782495-46-9 HCAPLUS

CN Lithium tungsten metaphosphate oxide (Li_{2.8}W_{0.6}(PO₃)_{0.9}) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O	0.9	17778-80-2
O ₃ P	1	15389-19-2
W	0.6	7440-33-7
Li	2.8	7439-93-2

RN 782495-47-0 HCAPLUS

CN Lithium vanadium oxide phosphate (Li_{2.8}V_{0.2}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.4	17778-80-2
O ₄ P	1	14265-44-2
V	0.2	7440-62-2
Li	2.8	7439-93-2

RN 782495-48-1 HCAPLUS

CN Chromium lithium oxide phosphate (Cr_{0.2}Li_{2.8}O₂(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.2	17778-80-2
O ₄ P	1	14265-44-2
Cr	0.2	7440-47-3
Li	2.8	7439-93-2

RN 782495-49-2 HCAPLUS

CN Lithium manganese oxide phosphate (Li_{2.8}Mn_{0.2}O₂(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.3	17778-80-2
O ₄ P	1	14265-44-2
Mn	0.2	7439-96-5
Li	2.8	7439-93-2

RN 782495-50-5 HCAPLUS

CN Iron lithium oxide phosphate (Fe_{0.2}Li_{2.8}O₂(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.17	17778-80-2
O ₄ P	1	14265-44-2
Li	2.8	7439-93-2
Fe	0.2	7439-89-6

RN 782495-51-6 HCAPLUS

CN Cobalt lithium oxide phosphate (Co_{0.2}Li_{2.8}O₂(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.17	17778-80-2
O ₄ P	1	14265-44-2
Co	0.2	7440-48-4
Li	2.8	7439-93-2

RN 782495-52-7 HCAPLUS

CN Lithium nickel oxide phosphate (Li_{2.8}Ni_{0.2}O₂(PO₄)) (CA INDEX NAME)

Component | Ratio | Component

10/551,935

			Registry Number
O	0.1		17778-80-2
O4P	1		14265-44-2
Ni	0.2		7440-02-0
Li	2.8		7439-93-2

RN 782495-53-8 HCPLUS
CN Copper lithium oxide phosphate (Cu0.2Li2.800.1(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	0.1		17778-80-2
O4P	1		14265-44-2
Cu	0.2		7440-50-8
Li	2.8		7439-93-2

RN 782495-54-9 HCPLUS
CN Lithium zirconium oxide phosphate (Li2.8Zr0.200.3(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	0.3		17778-80-2
O4P	1		14265-44-2
Zr	0.2		7440-67-7
Li	2.8		7439-93-2

RN 782495-55-0 HCPLUS
CN Lithium niobium oxide phosphate (Li2.8Nb0.200.4(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	0.4		17778-80-2
O4P	1		14265-44-2
Nb	0.2		7440-03-1
Li	2.8		7439-93-2

RN 782495-56-1 HCPLUS
CN Lithium molybdenum oxide phosphate (Li2.8Mo0.200.5(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	0.5		17778-80-2
O4P	1		14265-44-2
Mo	0.2		7439-98-7
Li	2.8		7439-93-2

RN 782495-57-2 HCPLUS
CN Lithium silver phosphate (Li2.8Ag0.2(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	1		14265-44-2

10/551,935

Ag		0.2		7440-22-4
Li		2.8		7439-93-2

RN 782495-58-3 HCPLUS
CN Lithium tantalum oxide phosphate (Li_{2.8}Ta_{0.200.4}(PO₄)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		0.4		17778-80-2
O ₄ P		1		14265-44-2
Ta		0.2		7440-25-7
Li		2.8		7439-93-2

RN 782495-59-4 HCPLUS
CN Lithium tungsten oxide phosphate (Li_{2.8}W_{0.200.5}(PO₄)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		0.5		17778-80-2
O ₄ P		1		14265-44-2
W		0.2		7440-33-7
Li		2.8		7439-93-2

RN 782495-60-7 HCPLUS
CN Lithium titanium oxide phosphate (Li₄TiO_{2.250}(PO₄)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		1		17778-80-2
O ₄ P		1		14265-44-2
Ti		0.25		7440-32-6
Li		4		7439-93-2

RN 782495-61-8 HCPLUS
CN Lithium vanadium oxide phosphate (Li_{3.75}V_{0.250}(PO₄)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		1		17778-80-2
O ₄ P		1		14265-44-2
V		0.25		7440-62-2
Li		3.75		7439-93-2

RN 782495-62-9 HCPLUS
CN Chromium lithium oxide phosphate (Cr_{0.25}Li_{3.50}(PO₄)) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		1		17778-80-2
O ₄ P		1		14265-44-2
Cr		0.25		7440-47-3
Li		3.5		7439-93-2

RN 782495-63-0 HCPLUS

10/551,935

CN Lithium manganese oxide phosphate (Li_{3.25}Mn_{0.25}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O ₄ P	1	14265-44-2
Mn	0.25	7439-96-5
Li	3.25	7439-93-2

RN 782495-64-1 HCPLUS

CN Lithium niobium oxide phosphate (Li_{3.75}Nb_{0.25}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O ₄ P	1	14265-44-2
Nb	0.25	7440-03-1
Li	3.75	7439-93-2

RN 782495-65-2 HCPLUS

CN Lithium molybdenum oxide phosphate (Li_{3.5}Mo_{0.25}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O ₄ P	1	14265-44-2
Mo	0.25	7439-98-7
Li	3.5	7439-93-2

RN 782495-66-3 HCPLUS

CN Lithium tantalum oxide phosphate (Li_{3.75}Ta_{0.25}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O ₄ P	1	14265-44-2
Ta	0.25	7440-25-7
Li	3.75	7439-93-2

RN 782495-69-6 HCPLUS

CN Lithium tungsten oxide phosphate (Li_{3.02}W_{0.0100.04}O₄) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.04	17778-80-2
O ₄ P	1	14265-44-2
W	0.01	7440-33-7
Li	3.02	7439-93-2

RN 782495-74-3 HCPLUS

CN Lithium tungsten oxide phosphate (Li₅WO₄) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	4	17778-80-2
O4P	1	14265-44-2
W	1	7440-33-7
Li	5	7439-93-2

RN 782495-76-5 HCAPLUS

CN Lithium tungsten oxide phosphate (Li7W2O8(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	8	17778-80-2
O4P	1	14265-44-2
W	2	7440-33-7
Li	7	7439-93-2

IC ICM H01M010-36

ICS H01B001-06

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 782495-70-9, Lithium tungsten oxide phosphate (Li3.2W0.100.4(PO4)) 782495-72-1, Lithium tungsten oxide phosphate (Li3.66W0.33O1.32(PO4)) (solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

IT 782495-67-4, Lithium tungsten oxide phosphate (Li3.5W0.250(PO4)) (solid electrolytes containing lithium transition metal phosphorus oxides for secondary batteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO2) 782495-23-2, Lithium titanium metaphosphate oxide (Li2.8Ti0.2(PO3)00.9) 782495-24-3, Lithium vanadium metaphosphate oxide (Li2.8V0.2(PO3)00.9) 782495-25-4, Chromium lithium metaphosphate oxide (Cr0.2Li2.8(PO3)00.9) 782495-26-5, Lithium manganese metaphosphate oxide (Li2.8Mn0.2(PO3)00.9) 782495-27-6, Iron lithium metaphosphate oxide (Fe0.2Li2.8(PO3)00.9) 782495-28-7, Cobalt lithium metaphosphate oxide (Co0.2Li2.8(PO3)00.9) 782495-29-8, Lithium nickel metaphosphate oxide (Li2.8Ni0.2(PO3)00.9) 782495-30-1, Copper lithium metaphosphate oxide (Cu0.2Li2.8(PO3)00.9) 782495-31-2, Lithium zirconium metaphosphate oxide (Li2.8Zr0.2(PO3)00.9) 782495-32-3, Lithium niobium metaphosphate oxide (Li2.8Nb0.2(PO3)00.9) 782495-33-4, Lithium molybdenum metaphosphate oxide (Li2.8Mo0.2(PO3)00.9) 782495-34-5, Lithium ruthenium metaphosphate oxide (Li2.8Ru0.2(PO3)00.9) 782495-35-6, Lithium silver metaphosphate oxide (Li2.8Ag0.2(PO3)00.9) 782495-36-7, Lithium tantalum metaphosphate oxide (Li2.8Ta0.2(PO3)00.9) 782495-37-8, Lithium tungsten metaphosphate oxide (Li2.8W0.2(PO3)00.9) 782495-38-9, Lithium platinum metaphosphate oxide (Li2.8Pt0.2(PO3)00.9) 782495-39-0, Gold lithium metaphosphate oxide (Au0.2Li2.8(PO3)00.9) 782495-40-3, Lithium metaphosphate oxide (Li2.8(PO3)00.9) 782495-41-4, Lithium tungsten metaphosphate oxide (Li2.8W0.01(PO3)00.9) 782495-42-5, Lithium tungsten metaphosphate oxide (Li2.8W0.05(PO3)00.9) 782495-43-5, Lithium tungsten metaphosphate oxide (Li2.8W0.1(PO3)00.9)

782495-44-7, Lithium tungsten metaphosphate oxide
 (Li₂.8W_{0.5}(PO₃)_{0.9}) 782495-47-8, Lithium tungsten
 metaphosphate oxide (Li₂.8W_{0.52}(PO₃)_{0.9}) 782495-46-9,
 Lithium tungsten metaphosphate oxide (Li₂.8W_{0.6}(PO₃)_{0.9})
 782495-47-0, Lithium vanadium oxide phosphate
 (Li₂.8V_{0.200.4}(PO₄)) 782495-48-1, Chromium lithium oxide
 phosphate (Cr_{0.2}Li₂.800.2(PO₄)) 782495-49-2, Lithium
 manganese oxide phosphate (Li₂.8Mn_{0.200.3}(PO₄)) 782495-50-3,
 Iron lithium oxide phosphate (Fe_{0.2}Li₂.800.17(PO₄))
 782495-51-6, Cobalt lithium oxide phosphate
 (Co_{0.2}Li₂.800.17(PO₄)) 782495-52-7, Lithium nickel oxide
 phosphate (Li₂.8Ni_{0.200.1}(PO₄)) 782495-53-8, Copper lithium
 oxide phosphate (Cu_{0.2}Li₂.800.1(PO₄)) 782495-54-9, Lithium
 zirconium oxide phosphate (Li₂.8Zr_{0.200.3}(PO₄)) 782495-55-0,
 Lithium niobium oxide phosphate (Li₂.8Nb_{0.200.4}(PO₄))
 782495-56-1, Lithium molybdenum oxide phosphate
 (Li₂.8Mo_{0.200.5}(PO₄)) 782495-57-2, Lithium silver phosphate
 (Li₂.8Ag_{0.2}(PO₄)) 782495-58-3, Lithium tantalum oxide
 phosphate (Li₂.8Ta_{0.200.4}(PO₄)) 782495-59-4, Lithium
 tungsten oxide phosphate (Li₂.8W_{0.200.5}(PO₄)) 782495-60-7,
 Lithium titanium oxide phosphate (Li₄Ti_{0.250}(PO₄)) 782495-61-8
 , Lithium vanadium oxide phosphate (Li₃.75V_{0.250}(PO₄))
 782495-62-9, Chromium lithium oxide phosphate
 (Cr_{0.25}Li_{3.50}(PO₄)) 782495-63-0, Lithium manganese oxide
 phosphate (Li₃.25Mn_{0.250}(PO₄)) 782495-64-1, Lithium niobium
 oxide phosphate (Li₃.75Nb_{0.250}(PO₄)) 782495-65-2, Lithium
 molybdenum oxide phosphate (Li₃.5Mo_{0.250}(PO₄)) 782495-66-3,
 Lithium tantalum oxide phosphate (Li₃.75Ta_{0.250}(PO₄))
 782495-67-6, Lithium tungsten oxide phosphate
 (Li₃.02W_{0.0100.04}(PO₄)) 782495-74-3, Lithium tungsten oxide
 phosphate (Li₅WO₄(PO₄)) 782495-76-5, Lithium tungsten oxide
 phosphate (Li₇W₂₀₈(PO₄))
 (solid electrolytes containing lithium transition metal phosphorus
 oxides for secondary batteries)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 REFORMAT

L25 ANSWER 5 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:824972 HCPLUS Full-text
 DOCUMENT NUMBER: 141:334894
 TITLE: Battery electrodes comprising mixed active
 particles
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid; Kelley, Tracy E.
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 40 pp.
 CODEN: USXKC0
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 3
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040197654	A1	20041007	US 2003-406890 <--	20030403
US 7041239	B2	20060509	CA 2004-2520876 <--	20040322
CA 2520876	A1	20041104	WO 2004-US8839	20040322
WO 2004095607	A2	20041104		

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A3 20050922

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
 MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,
 SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
 VC, VN, YU, ZA, ZM, ZW
 RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
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 DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT,
 RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
 ML, MR, NE, SN, TD, TG

EP 1625596

A2 20060215

EP 2004-759733

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 PL, SK

CN 1795514

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CN 2004-80014147

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JP 2006523368

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JP 2006-507482

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US 20060194112

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US 2006-381602

20060504

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US 20070141468

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20070621

US 2007-676707

20070220

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PRIORITY APPLN. INFO.:

US 2003-406890

A 20030403

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WO 2004-US8839

W 20040322

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US 2006-381602

A2 20060504

ED Entered STN: 08 Oct 2004

AB Electrode active materials comprising two or more groups of particles having differing chemical compns., wherein each group of particles comprises a material selected from: (a) materials of the formula $\text{Al}_x\text{M}^{3+}_{y}\text{O}_z(\text{XY}_4)^{c}\text{Z}_d$; and (b) materials of the formula $\text{A}_2\text{eM}_2\text{fO}_g$; and wherein (i) A_1 , A_2 , and A_3 are Li, Na, or K; (ii) M_1 and M_3 comprise a transition metal; (iv) XY₄ a phosphate or similar moiety; and (v) Z is OH, or halogen. In a preferred embodiment, $\text{A}_2\text{eM}_3\text{fO}_g$ is $\text{A}_3\text{hMn}_4\text{O}_4$ having an inner and an outer region, wherein the inner region comprises a cubic spinel manganese oxide, and the outer region comprises a manganese oxide enriched in Mn⁴⁺ relative to the inner region. In a preferred embodiment, the compns. also comprise a basic compound

IT 484039-94-1, Cobalt lithium fluoride phosphate $\text{CoLi}_2\text{F}(\text{PO}_4)$ 484039-96-3, Iron lithium fluoride phosphate $\text{FeLi}_2\text{F}(\text{PO}_4)$

484039-98-5, Iron lithium magnesium fluoride phosphate

Fe_{0.9}Li₂Mg_{0.1}F(PO₄) 484039-98-4, Lithium manganese fluoridephosphate Li₂MnF(PO₄) 771556-75-3 771556-77-5

(battery electrodes comprising mixed active particles)

RN 484039-84-1 HCAPLUS

CN Cobalt lithium fluoride phosphate (CoLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
F	1	14762-94-8	
O4P	1	14265-44-2	
Co	1	7440-48-4	
Li	2	7439-93-2	

RN 484039-86-3 HCPLUS
 CN Iron lithium fluoride phosphate (FeLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Li	2	7439-93-2
Fe	1	7439-89-6

RN 484039-88-5 HCPLUS
 CN Iron lithium magnesium fluoride phosphate (Fe0.9Li₂Mg0.1F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mg	0.1	7439-95-4
Li	2	7439-93-2
Fe	0.9	7439-89-6

RN 484039-95-4 HCPLUS
 CN Lithium manganese fluoride phosphate (Li₂MnF(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2

RN 771556-75-3 HCPLUS
 CN Iron lithium magnesium fluoride phosphate (Fe0.8Li₂Mg0.2F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mg	0.2	7439-95-4
Li	2	7439-93-2
Fe	0.8	7439-89-6

RN 771556-77-5 HCPLUS
 CN Iron lithium magnesium fluoride phosphate (Fe0.95Li₂Mg0.05F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mg	0.05	7439-95-4
Li	2	7439-93-2

Fe | 0.95 | 7439-89-6

IC ICM H01M004-58

ICS H01M004-50

INCL 429218100; X42-923.11; X42-922.4; X42-922.1; X42-922.3; X42-923.15; X42-923.19; X42-923.195; X25-218.21; X42-923.16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 12031-65-1, Lithium nickel oxide linio₂ 12162-92-4, Lithium vanadium oxide liv₂o₅ 12190-79-3, Cobalt lithium oxide colio₂ 12527-46-7, Copper lithium oxide culi₂o₂ 13826-59-0, Lithium manganese phosphate limpo₄ 14066-20-7, Dihydrogen phosphate, uses 15365-14-7, Iron lithium phosphate felipo₄ 39457-42-6, Lithium manganese oxide 131344-56-4, Cobalt lithium nickel oxide 142585-37-3, Copper lithium oxide culio₂ 143623-49-8, Cobalt lithium nickel oxide Co_{0.25}LiNiO_{0.75}O₂ 193214-24-3, Aluminum cobalt lithium nickel oxide A10.05Co_{0.15}LiNiO_{0.80} 349632-85-5, Iron lithium magnesium phosphate Fe_{0.8}LiMg_{0.2}(PO₄) 405914-53-6, Cobalt lithium magnesium phosphate Co_{0.9}LiMg_{0.1}(PO₄) 484039-84-1, Cobalt lithium fluoride phosphate Coli₂F(PO₄) 484039-86-3, Iron lithium fluoride phosphate FeLi₂F(PO₄) 484039-88-5, Iron lithium magnesium fluoride phosphate Fe_{0.9}Li₂Mg_{0.1}F(PO₄) 484039-95-4, Lithium manganese fluoride phosphate Li₂MnF(PO₄) 610271-90-4, Aluminum cobalt iron lithium magnesium manganese phosphate A10.02Co_{0.07}Fe_{0.08}Li₁0.02Mg_{0.05}Mn_{0.12}(PO₄) 610271-94-8, Aluminum cobalt iron lithium magnesium phosphate A10.02Co_{0.08}Fe_{0.1}Li₁0.02Mg_{0.05}(PO₄) 610271-97-1, Aluminum cobalt iron lithium magnesium phosphate A10.02Co_{0.07}Fe_{0.15}Li₁0.02Mg_{0.05}(PO₄) 610272-06-5, Aluminum cobalt iron lithium titanium phosphate A10.02Co_{0.08}Fe_{0.1}Li₁0.02Ti_{0.02}(PO₄) 610310-97-9, Cobalt iron lithium magnesium titanium phosphate Co_{0.8}Fe_{0.1}LiMg_{0.05}Ti_{0.02}(PO₄) 610321-55-6, Cobalt iron lithium magnesium titanium fluoride metaphosphate oxide Co_{0.8}Fe_{0.1}Li₁0.02Mg_{0.02}Ti_{0.02}(PO₃)_{0.98} 610321-57-8, Cobalt iron lithium magnesium titanium phosphate Co_{0.8}2Fe_{0.1}LiMg_{0.02}Ti_{0.02}(PO₄) 610321-60-3, Aluminum cobalt iron lithium magnesium fluoride metaphosphate oxide A10.02Co_{0.08}Fe_{0.1}LiMg_{0.05}F_{0.02}(PO₃)_{0.98} 610754-69-3, Aluminum calcium cobalt iron lithium fluoride metaphosphate oxide A10.02Ca_{0.05}Co_{0.8}Fe_{0.1}LiF_{0.02}(PO₃)_{0.98} 632286-77-2, Iron lithium magnesium phosphate Fe_{0.9}LiMg_{0.1}PO₄ 632286-77-2, Iron lithium magnesium phosphate Fe_{0.9}LiMg_{0.1}(PO₄) 643752-34-5, Iron lithium magnesium phosphate Fe_{0.95}LiMg_{0.05}(PO₄) 643752-34-5, Iron lithium magnesium phosphate (Fe_{0.95}LiMg_{0.05}(PO₄)) 771556-73-1, Aluminum cobalt iron lithium phosphate (A10.02Co_{0.08}Fe_{0.1}Li₁0.02(PO₄)) 771556-74-2 771556-75-3 771556-77-5

(battery electrodes comprising mixed active particles)

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 6 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:759266 HCPLUS Full-text

DOCUMENT NUMBER: 141:280353

TITLE: Production of lithium compound phosphate cathodes for secondary lithium ion batteries

INVENTOR(S): Ishizuka, Masayuki; Ono, Koji; Toge, Yoshiyuki; Saito, Mitsumasa

PATENT ASSIGNEE(S): Sumitomo Osaka Cement Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004259471	A	20040916	JP 2003-45885 <--	20030224
PRIORITY APPLN. INFO.:			JP 2003-45885 <--	20030224

ED Entered STN: 17 Sep 2004
 AB The lithium compound phosphates, having olivine-type structure, are produced by a process including steps of (1) spray thermal decomposition of solns. or suspensions containing Li, metals excluding Li, and P, and (2) firing the resultant decomposition products. The phosphates may be expressed by $\text{Li}_x\text{A}_y\text{PO}_4$ ($\text{A} = \text{Cr}, \text{Mn}, \text{Fe}, \text{Co}, \text{Ni}, \text{Cu}; 0 < x < 2; 0 < y \leq 1$). In the production, elec. conductive substances and/or their precursors may be added to the solns./suspensions. The cathodes can be economically produced, and secondary lithium batteries employing the cathodes show high discharge capacity.
 IT 757954-84-0, Chromium lithium phosphate ($\text{Cr}_0\text{-}\text{Li}_0\text{-}2(\text{PO}_4)$)
 757954-86-2, Lithium manganese phosphate ($\text{Li}_0\text{-}2\text{Mn}_0\text{-}1(\text{PO}_4)$)
 757954-88-4, Lithium nickel phosphate ($\text{Li}_0\text{-}2\text{Ni}_0\text{-}1(\text{PO}_4)$)
 757954-90-8, Copper lithium phosphate ($\text{Cu}_0\text{-}\text{Li}_0\text{-}2(\text{PO}_4)$)
 (cathodes; preparation of lithium (transition) metal phosphate cathodes
 for lithium ion batteries by spray thermal decomposition and firing)
 RN 757954-84-0 HCAPLUS
 CN Chromium lithium phosphate ($\text{Cr}_0\text{-}\text{Li}_0\text{-}2(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cr	0 - 1	7440-47-3
Li	0 - 2	7439-93-2

RN 757954-86-2 HCAPLUS
 CN Lithium manganese phosphate ($\text{Li}_0\text{-}2\text{Mn}_0\text{-}1(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mn	0 - 1	7439-96-5
Li	0 - 2	7439-93-2

RN 757954-88-4 HCAPLUS
 CN Lithium nickel phosphate ($\text{Li}_0\text{-}2\text{Ni}_0\text{-}1(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ni	0 - 1	7440-02-0
Li	0 - 2	7439-93-2

RN 757954-90-8 HCAPLUS
 CN Copper lithium phosphate ($\text{Cu}_0\text{-}\text{Li}_0\text{-}2(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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10/551,935

| Registry Number

O4P	1	14265-44-2
Cu	0 - 1	7440-50-8
Li	0 - 2	7439-93-2

IT 757954-80-6P, Cobalt lithium phosphate ($\text{CoO-Li}_0\text{-2(PO}_4\text{)}$)
 757954-82-8P, Iron lithium phosphate ($\text{FeO-Li}_0\text{-2(PO}_4\text{)}$)
 (cathodes; preparation of lithium (transition) metal phosphate cathodes
 for lithium ion batteries by spray thermal decomposition and firing)

RN 757954-80-6 HCPLUS

CN Cobalt lithium phosphate ($\text{CoO-Li}_0\text{-2(PO}_4\text{)}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Co	0 - 1	7440-48-4
Li	0 - 2	7439-93-2

RN 757954-82-8 HCPLUS

CN Iron lithium phosphate ($\text{FeO-Li}_0\text{-2(PO}_4\text{)}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 2	7439-93-2
Fe	0 - 1	7439-89-6

IC ICM H01M004-58

ICS C01B025-45; H01M004-62; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

IT 757954-94-0, Chromium lithium phosphate ($\text{CrO-Li}_0\text{-2(PO}_4\text{)}$)
 757954-96-2, Lithium manganese phosphate ($\text{Li}_0\text{-2MnO}_1\text{-1(PO}_4\text{)}$)
 757954-98-4, Lithium nickel phosphate ($\text{Li}_0\text{-2NiO}_1\text{-1(PO}_4\text{)}$)
 757954-99-8, Copper lithium phosphate ($\text{CuO-Li}_0\text{-2(PO}_4\text{)}$)
 (cathodes; preparation of lithium (transition) metal phosphate cathodes
 for lithium ion batteries by spray thermal decomposition and firing)
 IT 757954-80-6P, Cobalt lithium phosphate ($\text{CoO-Li}_0\text{-2(PO}_4\text{)}$)
 757954-82-8P, Iron lithium phosphate ($\text{FeO-Li}_0\text{-2(PO}_4\text{)}$)
 (cathodes; preparation of lithium (transition) metal phosphate cathodes
 for lithium ion batteries by spray thermal decomposition and firing)

L25 ANSWER 7 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:759265 HCPLUS Full-text

DOCUMENT NUMBER: 141:280352

TITLE: Lithium transition metal phosphate cathodes for
lithium ion batteriesINVENTOR(S): Ishizuka, Masayuki; Ono, Koji; Yamada, Satoshi;
Toge, Yoshiyuki; Saito, Mitsumasa

PATENT ASSIGNEE(S): Sumitomo Osaka Cement Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004259470	A	20040916	JP 2003-45884 <--	20030224
PRIORITY APPLN. INFO.:			JP 2003-45884 <--	20030224

ED Entered STN: 17 Sep 2004

AB The cathodes are expressed by olivine-type Li_xAyPO_4 ($\text{A} = \text{Cr, Mn, Fe, Co, Ni, Cu}$; $0 < x < 2$; $0 < y \leq 1$) with crystallite diameter of ≤ 35 nm. The cathodes can be economically produced, and secondary lithium batteries employing the cathodes show high discharge capacity.

IT 757954-84-0, Chromium lithium phosphate ($\text{CrO}-1\text{LiO}-2(\text{PO}_4)$)
757954-86-2, Lithium manganese phosphate ($\text{LiO}-2\text{MnO}-1(\text{PO}_4)$)
757954-88-4, Lithium nickel phosphate ($\text{LiO}-2\text{NiO}-1(\text{PO}_4)$)
757954-90-8, Copper lithium phosphate ($\text{CuO}-1\text{LiO}-2(\text{PO}_4)$)
(cathodes; lithium transition metal phosphate cathodes for lithium ion batteries)

RN 757954-84-0 HCPLUS

CN Chromium lithium phosphate ($\text{CrO}-1\text{LiO}-2(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cr	0 - 1	7440-47-3
Li	0 - 2	7439-93-2

RN 757954-86-2 HCPLUS

CN Lithium manganese phosphate ($\text{LiO}-2\text{MnO}-1(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Mn	0 - 1	7439-96-5
Li	0 - 2	7439-93-2

RN 757954-88-4 HCPLUS

CN Lithium nickel phosphate ($\text{LiO}-2\text{NiO}-1(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ni	0 - 1	7440-02-0
Li	0 - 2	7439-93-2

RN 757954-90-8 HCPLUS

CN Copper lithium phosphate ($\text{CuO}-1\text{LiO}-2(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Cu	0 - 1	7440-50-8
Li	0 - 2	7439-93-2

IT 757954-80-6P, Cobalt lithium phosphate ($\text{CoO}-1\text{LiO}-2(\text{PO}_4)$)

757954-82-8P, Iron lithium phosphate ($\text{FeO}-1\text{LiO}-2(\text{PO}_4)$)
(cathodes; lithium transition metal phosphate cathodes for lithium

ion batteries)
 RN 757954-80-6 HCPLUS
 CN Cobalt lithium phosphate (Co0-1Li0-2(PO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Co	0 - 1	7440-48-4
Li	0 - 2	7439-93-2

RN 757954-82-8 HCPLUS
 CN Iron lithium phosphate (Fe0-1Li0-2(PO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0 - 2	7439-93-2
Fe	0 - 1	7439-89-6

IC ICM H01M004-58
 ICS C01B025-45; H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT 757954-84-0, Chromium lithium phosphate (Cr0-1Li0-2(PO4))
 757954-86-2, Lithium manganese phosphate (Li0-2Mn0-1(PO4))
 757954-88-4, Lithium nickel phosphate (Li0-2Ni0-1(PO4))
 757954-90-8, Copper lithium phosphate (Cu0-1Li0-2(PO4))
 (cathodes; lithium transition metal phosphate cathodes for lithium
 ion batteries)
 IT 757954-80-6P, Cobalt lithium phosphate (Co0-1Li0-2(PO4))
 757954-82-8P, Iron lithium phosphate (Fe0-1Li0-2(PO4))
 (cathodes; lithium transition metal phosphate cathodes for lithium
 ion batteries)

L25 ANSWER 8 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:632469 HCPLUS [Full-text](#)
 DOCUMENT NUMBER: 141:176832
 TITLE: Nonaqueous electrolyte lithium ion secondary
 battery containing lithium-based composite metal
 oxide for improved discharge capacity and thermal
 stability
 INVENTOR(S): Kubo, Koichi
 PATENT ASSIGNEE(S): Toshiba Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004220801	A	20040805	JP 2003-3291 -->	20030109
JP 3887317	B2	20070228	JP 2003-3291 -->	20030109
PRIORITY APPLN. INFO.:				

ED Entered STN: 06 Aug 2004

AB Disclosed is the nonaq. electrolyte lithium ion secondary battery comprising (a) a pos. electrode containing a metal oxide $\text{Li}_{2-x}\text{M}^{\prime}-\text{y}\text{Z}\text{AO}_4$ ($\text{M} = \text{Ti, Nb, etc.}; \text{M}' = \text{V, Cr, Mn, etc.}; \text{x} = 0, \text{F}; \text{A} = \text{Si, Ge, P, S}; 0 \leq \text{x} \leq 2; 0 \leq \text{y} \leq 0.5$; and $0.55 \leq \text{z} \leq 1.5$) having the tetragonal crystal structure, (b) a neg. electrode, and (c) a nonaq. electrolyte.

IT 732298-51-0, Lithium molybdenum oxide phosphate ($\text{Li}_2\text{MoO}(\text{PO}_4)$)
 732298-52-1, Lithium niobium oxide phosphate ($\text{Li}_2\text{NbO}(\text{PO}_4)$)
 732298-53-2, Lithium tantalum oxide phosphate ($\text{Li}_2\text{TaO}(\text{PO}_4)$)
 732298-54-3, Lithium tungsten oxide phosphate ($\text{Li}_2\text{WO}(\text{PO}_4)$)
 732298-55-4, Iron lithium molybdenum oxide phosphate
 $(\text{Fe}_{0.33}\text{Li}_2\text{MoO}_0.67\text{O}(\text{PO}_4))$ 732298-58-7 732298-59-8,
 Iron lithium tantalum fluoride phosphate ($\text{Fe}_{0.5}\text{Li}_2\text{TaO}_0.5\text{F}(\text{PO}_4)$)
 732298-60-1 732298-61-2 732298-62-3
 732298-66-7, Lithium molybdenum oxide phosphate
 $(\text{Li}_2\text{MoO}_1.5(\text{PO}_4))$ 732298-67-8, Lithium titanium oxide
 phosphate ($\text{Li}_2\text{TiO}_0.5(\text{PO}_4)$)
 (pos. electrode of nonaq. electrolyte lithium ion secondary
 battery)

RN 732298-51-0 HCPLUS

CN Lithium molybdenum oxide phosphate ($\text{Li}_2\text{MoO}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Mo	1	7439-98-7
Li	2	7439-93-2

RN 732298-52-1 HCPLUS

CN Lithium niobium oxide phosphate ($\text{Li}_2\text{NbO}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Nb	1	7440-03-1
Li	2	7439-93-2

RN 732298-53-2 HCPLUS

CN Lithium tantalum oxide phosphate ($\text{Li}_2\text{TaO}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Ta	1	7440-25-7
Li	2	7439-93-2

RN 732298-54-3 HCPLUS

CN Lithium tungsten oxide phosphate ($\text{Li}_2\text{WO}(\text{PO}_4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
W	1	7440-33-7

10/551,935

Li | 2 | 7439-93-2

RN 732298-55-4 HCPLUS

CN Iron lithium molybdenum oxide phosphate (Fe0.33Li2Mo0.67O(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Mo	0.67	7439-98-7
Li	2	7439-93-2
Fe	0.33	7439-89-6

RN 732298-58-7 HCPLUS

CN Lithium molybdenum ruthenium oxide phosphate (Li2Mo0.9Ru0.1O(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Ru	0.1	7440-18-8
Mo	0.9	7439-98-7
Li	2	7439-93-2

RN 732298-59-8 HCPLUS

CN Iron lithium tantalum fluoride phosphate (Fe0.5Li2Ta0.5F(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O4P	1	14265-44-2
Ta	0.5	7440-25-7
Li	2	7439-93-2
Fe	0.5	7439-89-6

RN 732298-60-1 HCPLUS

CN Lithium molybdenum titanium oxide phosphate (Li2Mo0.5Ti0.5O(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4P	1	14265-44-2
Ti	0.5	7440-32-6
Mo	0.5	7439-98-7
Li	2	7439-93-2

RN 732298-61-2 HCPLUS

CN Lithium molybdenum rhodium oxide phosphate (Li2Mo0.9Rh0.1O(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O		1		17778-80-2
O4P		1		14265-44-2
Rh		0.1		7440-16-6
Mo		0.9		7439-98-7
Li		2		7439-93-2

RN 732298-62-3 HCPLUS

CN Lithium molybdenum niobium oxide phosphate (Li₂Mo_{0.5}Nb_{0.5}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	1	17778-80-2	
O4P	1	14265-44-2	
Nb	0.5	7440-03-1	
Mo	0.5	7439-98-7	
Li	2	7439-93-2	

RN 732298-66-7 HCPLUS

CN Lithium molybdenum oxide phosphate (Li₂MoO_{1.5}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	1.5	17778-80-2	
O4P	1	14265-44-2	
Mo	1	7439-98-7	
Li	2	7439-93-2	

RN 732298-67-8 HCPLUS

CN Lithium titanium oxide phosphate (Li₂TiO_{0.5}(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	0.5	17778-80-2	
O4P	1	14265-44-2	
Ti	1	7440-32-6	
Li	2	7439-93-2	

IC ICM H01M004-58

ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 530740-14-8, Molybdenum oxide phosphate (Mo₂O₃(PO₄)₂)
 732298-51-0, Lithium molybdenum oxide phosphate (Li₂MoO(PO₄))
 732298-52-1, Lithium niobium oxide phosphate (Li₂NbO(PO₄))
 732298-53-2, Lithium tantalum oxide phosphate (Li₂TaO(PO₄))
 732298-54-3, Lithium tungsten oxide phosphate (Li₂WO(PO₄))
 732298-55-4, Iron lithium molybdenum oxide phosphate
 (Fe_{0.33}Li₂Mo_{0.670}(PO₄)) 732298-56-5, Germanium lithium molybdenum oxide (GeLi₂MoO₅) 732298-58-7 732298-59-8, Iron lithium tantalum fluoride phosphate (Fe_{0.5}Li₂TaO_{0.5}F(PO₄))
 732298-60-1 732298-61-2 732298-62-3
 732298-63-4, Lithium titanium oxide sulfate (Li₂TiO(SO₄))
 732298-64-5, Lithium titanium vanadium oxide sulfate
 (Li₂TiO_{0.5}V_{0.5}(SO₄)) 732298-65-6, Lithium niobium vanadium oxide sulfate (Li₂NbO_{0.5}V_{0.5}(SO₄)) 732298-66-7, Lithium molybdenum

oxide phosphate (Li₂MoO_{1.5}(PO₄)) 732293-67-8, Lithium
 titanium oxide phosphate (Li₂TiO_{0.5}(PO₄)) 732298-68-9, Lithium
 tungsten oxide silicate (Li₂WO(SiO₄)
 (pos. electrode of nonaq. electrolyte lithium ion secondary
 battery)

L25 ANSWER 9 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2004:546642 HCAPLUS Full-text
 DOCUMENT NUMBER: 141:91814
 TITLE: Method of preparation of battery electrode active
 material
 INVENTOR(S): Adamson, George; Barker, Jeremy; Ceder, Gerbrand;
 Dong, Ming; Morgan, Dane; Saidi, Yazid M.
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: PCT Int. Appl., 71 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004057691	A1	20040708	WO 2003-US40930	20031219 ---
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2455540	A1	20040619	CA 2003-2455540	20031219 ---
US 20040131939	A1	20040708	US 2003-741257	20031219 ---
AU 2003297466	A1	20040714	AU 2003-297466	20031219 ---
EP 1500154	A1	20050126	EP 2003-793455	20031219 ---
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK CN 1692510	A	20051102	CN 2003-80100192	20031219 ---
JP 2006511038	T	20060330	JP 2004-544174	20031219 ---
US 20060083990	A1	20060420	US 2005-291298	20051201 ---
PRIORITY APPLN. INFO.:			US 2002-435144P	P 20021219 ---
			US 2003-741257	A3 20031219 ---
			WO 2003-US40930	W 20031219 ---

ED Entered STN: 08 Jul 2004

AB The invention provides an electrochem. cell which includes a first electrode and a second electrode which is a counter electrode to the first electrode, and an electrolyte material interposed there between. The first electrode includes an alkali metal phosphorous compound doped with an element having a valence state greater than that of the alkali metal.

IT 714248-83-6P, Lithium vanadium phosphate (Li₂.99V₂(PO₄)₃)
714248-85-3P, Lithium vanadium phosphate (Li₂.98V₂(PO₄)₃)
(Nb-doped; method of preparation of battery electrode active material)

RN 714248-83-6 HCPLUS

CN Lithium vanadium phosphate (Li₂.99V₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Li	2.99	7439-93-2

RN 714248-85-8 HCPLUS

CN Lithium vanadium phosphate (Li₂.98V₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Li	2.98	7439-93-2

(Zr-doped; method of prepn. of battery electrode active material)
IT 714248-79-0P, Lithium vanadium zirconium phosphate
(Li₂.96V₂Zr_{0.01}(PO₄)₃) 714248-80-3P, Lithium vanadium
zirconium phosphate (Li₂.9V₂Zr_{0.02}(PO₄)₃) 714248-81-4P,
Lithium vanadium zirconium phosphate (Li₂.8V₂Zr_{0.05}(PO₄)₃)
714248-86-9P, Lithium niobium vanadium phosphate
(Li₂.97Nb_{0.01}V₂(PO₄)₃) 714248-87-0P, Lithium niobium
vanadium phosphate (Li₂.96Nb_{0.01}V₂(PO₄)₃) 714248-88-1P,
Lithium niobium vanadium phosphate (Li₂.95Nb_{0.01}V₂(PO₄)₃)
714248-90-5P, Lithium magnesium vanadium phosphate
(Li₂.98Mg_{0.01}V₂(PO₄)₃) 714248-91-6P, Lithium magnesium
vanadium phosphate (Li₂.94Mg_{0.03}V₂(PO₄)₃) 714248-93-8P,
Lithium magnesium vanadium phosphate (Li₂.9Mg_{0.05}V₂(PO₄)₃)
714248-95-0P, Lithium magnesium vanadium phosphate
(Li₂.8Mg_{0.1}V₂(PO₄)₃)
(method of preparation of battery electrode active material)

RN 714248-79-0 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₂.96V₂Zr_{0.01}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.01	7440-67-7
V	2	7440-62-2
Li	2.96	7439-93-2

RN 714248-80-3 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₂.9V₂Zr_{0.02}(PO₄)₃) (CA INDEX
NAME)

10/551,935

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.02	7440-67-7
V	2	7440-62-2
Li	2.9	7439-93-2

RN 714248-81-4 HCPLUS

CN Lithium vanadium zirconium phosphate (Li_{2.8}V₂Zr_{0.05}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.05	7440-67-7
V	2	7440-62-2
Li	2.8	7439-93-2

RN 714248-86-9 HCPLUS

CN Lithium niobium vanadium phosphate (Li_{2.97}Nb_{0.01}V₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Nb	0.01	7440-03-1
Li	2.97	7439-93-2

RN 714248-87-0 HCPLUS

CN Lithium niobium vanadium phosphate (Li_{2.96}Nb_{0.01}V₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Nb	0.01	7440-03-1
Li	2.96	7439-93-2

RN 714248-88-1 HCPLUS

CN Lithium niobium vanadium phosphate (Li_{2.95}Nb_{0.01}V₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Nb	0.01	7440-03-1
Li	2.95	7439-93-2

RN 714248-90-5 HCPLUS

CN Lithium magnesium vanadium phosphate (Li_{2.98}Mg_{0.01}V₂(PO₄)₃) (CA INDEX NAME)

10/551,935

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Mg	0.01	7439-95-4
Li	2.98	7439-93-2

RN 714248-91-6 HCAPLUS
CN Lithium magnesium vanadium phosphate ($\text{Li}_{2.94}\text{Mg}_{0.03}\text{V}_2(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Mg	0.03	7439-95-4
Li	2.94	7439-93-2

RN 714248-93-8 HCAPLUS
CN Lithium magnesium vanadium phosphate ($\text{Li}_{2.9}\text{Mg}_{0.05}\text{V}_2(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Mg	0.05	7439-95-4
Li	2.9	7439-93-2

RN 714248-95-0 HCAPLUS
CN Lithium magnesium vanadium phosphate ($\text{Li}_{2.8}\text{Mg}_{0.1}\text{V}_2(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	2	7440-62-2
Mg	0.1	7439-95-4
Li	2.8	7439-93-2

- IC ICM H01M004-48
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 714248-83-6P, Lithium vanadium phosphate ($\text{Li}_{2.99}\text{V}_2(\text{PO}_4)_3$)
714248-85-8P, Lithium vanadium phosphate ($\text{Li}_{2.98}\text{V}_2(\text{PO}_4)_3$)
714249-02-2P, Cobalt lithium phosphate ($\text{CoLi}_{0.99}(\text{PO}_4)$) 714249-20-4P,
Iron lithium phosphate ($\text{FeLi}_{0.99}(\text{PO}_4)$)
(Nb-doped; method of preparation of battery electrode active material)
IT 714248-75-6P, Lithium manganese phosphate ($\text{Li}_{0.98}\text{Mn}(\text{PO}_4)$)
714248-85-8P, Lithium vanadium phosphate ($\text{Li}_{2.98}\text{V}_2(\text{PO}_4)_3$)
714248-97-2P, Cobalt lithium phosphate ($\text{CoLi}_{0.98}(\text{PO}_4)$) 714249-17-9P,
Iron lithium phosphate ($\text{FeLi}_{0.98}(\text{PO}_4)$)
(Zr-doped; method of preparation of battery electrode active material)
IT 15365-14-7P, Iron lithium phosphate $\text{FeLi}(\text{PO}_4)$ 554453-37-1P, Iron
lithium zirconium phosphate 554453-39-3P, Iron lithium niobium
phosphate 554453-42-8P, Iron lithium magnesium phosphate

714248-65-4P 714248-66-5P, Lithium manganese phosphate
 (Li_{0.99}Mn(PO₄)) 714248-67-6P, Lithium manganese niobium phosphate
 (Li_{0.97}MnNb_{0.01}(PO₄)) 714248-68-7P, Lithium manganese niobium phosphate
 (Li_{0.96}MnNb_{0.01}(PO₄)) 714248-69-8P 714248-70-1P, Lithium magnesium manganese phosphate (Li_{0.98}Mg_{0.01}Mn(PO₄)) 714248-71-2P,
 Lithium magnesium manganese phosphate (Li_{0.96}Mg_{0.02}Mn(PO₄))
 714248-72-3P, Lithium magnesium manganese phosphate
 (Li_{0.94}Mg_{0.03}Mn(PO₄)) 714248-73-4P, Lithium magnesium manganese phosphate (Li_{0.98}Mg_{0.05}Mn_{0.06}(PO₄)) 714248-74-5P 714248-76-7P,
 Lithium manganese zirconium phosphate (Li_{0.96}MnZr_{0.01}(PO₄))
 714248-77-8P 714248-79-0P, Lithium vanadium zirconium phosphate (Li_{2.96}V₂Zr_{0.01}(PO₄)) 714248-80-3P, Lithium vanadium zirconium phosphate (Li_{2.9}V₂Zr_{0.02}(PO₄))
 714248-81-4P, Lithium vanadium zirconium phosphate (Li_{2.8}V₂Zr_{0.05}(PO₄)) 714248-82-5P 714248-86-9P, Lithium niobium vanadium phosphate (Li_{2.97}Nb_{0.01}V₂(PO₄)) 714248-87-0P,
 , Lithium niobium vanadium phosphate (Li_{2.96}Nb_{0.01}V₂(PO₄))
 714248-88-1P, Lithium niobium vanadium phosphate (Li_{2.95}Nb_{0.01}V₂(PO₄)) 714248-89-2P 714248-90-5P, Lithium magnesium vanadium phosphate (Li_{2.98}Mg_{0.01}V₂(PO₄))
 714248-91-6P, Lithium magnesium vanadium phosphate (Li_{2.94}Mg_{0.03}V₂(PO₄)) 714248-93-8P, Lithium magnesium vanadium phosphate (Li_{2.9}Mg_{0.05}V₂(PO₄)) 714248-95-0P,
 Lithium magnesium vanadium phosphate (Li_{2.8}Mg_{0.1}V₂(PO₄))
 714248-96-1P 714248-99-4P, Cobalt lithium zirconium phosphate (CoLi_{0.96}Zr_{0.01}(PO₄)) 714249-00-0P 714249-04-4P, Cobalt lithium niobium phosphate (CoLi_{0.97}Nb_{0.01}(PO₄)) 714249-07-7P, Cobalt lithium niobium phosphate (CoLi_{0.96}Nb_{0.01}(PO₄)) 714249-08-8P 714249-10-2P,
 Cobalt lithium magnesium phosphate (CoLi_{0.98}Mg_{0.01}(PO₄))
 714249-11-3P, Cobalt lithium magnesium phosphate (CoLi_{0.96}Mg_{0.02}(PO₄))
 714249-13-5P, Cobalt lithium magnesium phosphate (CoLi_{0.94}Mg_{0.03}(PO₄))
 714249-15-7P, Cobalt lithium magnesium phosphate (Co_{0.86}Li_{0.98}Mg_{0.05}(PO₄)) 714249-19-1P, Iron lithium zirconium phosphate (FeLi_{0.96}Zr_{0.01}(PO₄)) 714249-22-6P, Iron lithium niobium phosphate (FeLi_{0.97}Nb_{0.01}(PO₄)) 714249-23-7P, Iron lithium niobium phosphate (FeLi_{0.96}Nb_{0.01}(PO₄)) 714249-25-9P, Iron lithium magnesium phosphate (FeLi_{0.98}Mg_{0.01}(PO₄)) 714249-27-1P, Iron lithium magnesium phosphate (Fe_{0.96}LiMg_{0.04}(PO₄)) 714249-28-2P, Iron lithium magnesium phosphate (Fe_{0.96}Li_{0.98}Mg_{0.05}(PO₄))
 (method of preparation of battery electrode active material)

L25 ANSWER 10 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:999003 HCAPLUS Full-text
 DOCUMENT NUMBER: 140:324022
 TITLE: Structure and battery properties of LiCoPO₄ and Li₂CoPO₄F
 AUTHOR(S): Okada, Shigeto; Ueno, Mizuki; Uebo, Yasushi;
 Yamaki, Jun-ichi
 CORPORATE SOURCE: Institute of Advanced Material Study, Kyushu University, Kasuga, 816-8580, Japan
 SOURCE: JAERI-Review (2003), 2003-019, Activity Report on the Utilization of Research Reactors, 322-323
 DOCUMENT TYPE: CODEN: JERVE9 Report
 LANGUAGE: English
 ED Entered STN: 23 Dec 2003
 AB The structure of ordered phospho-olivine LiCoPO₄ and fluoride phosphate Li₂CoPO₄F were investigated by neutron diffraction, and the cathode properties were compared using coin-type cells in a nonaq. electrolyte. Interat.

distances, ionic radii, and crystallog. data of the 2 compds. are given. The quasi open circuit voltage charge-discharge profiles showed that Li₂CoPO₄F is a new 5-V class cathode like LiCoPO₄, and the open-circuit voltage is higher than that of LiCoPO₄.

IT 484039-84-1, Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))
 (structure and battery properties of LiCoPO₄ and Li₂CoPO₄F)
 RN 484039-84-1 HCAPLUS
 CN Cobalt lithium fluoride phosphate (CoLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Co	1	7440-48-4
Li	2	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 72, 75

IT 13824-63-0, Cobalt lithium phosphate (CoLiPO₄) 484039-84-1,
 Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))

(structure and battery properties of LiCoPO₄ and Li₂CoPO₄F)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 11 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:796193 HCAPLUS Full-text

DOCUMENT NUMBER: 139:310049

TITLE: Batteries comprising alkali-transition metal phosphates and preferred electrolytes

INVENTOR(S): Pugh, James; Saidi, Mohammed Y.; Huang, Haitao USA

PATENT ASSIGNEE(S): U.S. Pat. Appl. Publ., 24 pp.

SOURCE: CODEN: USXKC0

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030190527	A1	20031009	US 2002-116276	20020403
			<--	
CA 2479790	A1	20031016	CA 2003-2479790	20030327
			<--	
WO 2003085757	A1	20031016	WO 2003-US9634	20030327
			<--	
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

10/551,935

AU 2003224801	A1	20031020	AU 2003-224801	20030327
			<--	
EP 1490917	A1	20041229	EP 2003-721492	20030327
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2005522009	T	20050721	JP 2003-582838	20030327
			<--	
CN 1650450	A	20050803	CN 2003-810033	20030327
			<--	
US 20050181283	A1	20050818	US 2005-80605	20050315
			<--	
PRIORITY APPLN. INFO.:			US 2002-116276	A 20020403
			<--	
			WO 2003-US9634	W 20030327
			<--	

ED Entered STN: 10 Oct 2003

AB Lithium batteries comprising: (a) an electrode comprising a material AaMb(XY4)cZd , wherein (i) A is an alkali metal and $0 < a \leq 9$; (ii) M comprises a transition metal, and $1 \leq b \leq 3$; (iii) XY4 is $X'04-x Y'x$, $X'04-y Y'2y$, $X''S4$, or mixts. thereof, where X' is P, As, Sb, Si, Ge, V, S, or mixts. thereof; X'' is P, As, Sb, Si, Ge, V, or mixts. thereof; Y' is halogen, S, N, or mixts. thereof; $0 \leq x < 3$; and $0 < y \leq 2$; and (iv) Z is OH, halogen, or mixts. thereof, and $0 \leq d \leq 6$; and (b) a counter-electrode; and (c) an electrolyte comprising an alkyl and/or alkylene carbonate and a cyclic ester. Preferably, M addnl. comprises at least one non-transition metal. Preferred embodiments include those having an olivine structure, where c = 1, and those having a NASICON structure, where c = 3.

IT 484040-22-4P, Lithium vanadium fluoride phosphate

(Li6V2F(PO4)3) 484040-28-0P

(batteries comprising alkali-transition metal phosphates and preferred electrolytes)

RN 484040-22-4 HCPLUS

CN Lithium vanadium fluoride phosphate (Li6V2F(PO4)3) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
F	1	14762-94-8	
O4P	3	14265-44-2	
V	2	7440-62-2	
Li	6	7439-93-2	

RN 484040-28-0 HCPLUS

CN Aluminum cobalt lithium magnesium fluoride phosphate
(Al0.02Co0.9Li2.02Mg0.05F(PO4)) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
F	1	14762-94-8	
O4P	1	14265-44-2	
Co	0.9	7440-48-4	
Mg	0.05	7439-95-4	
Li	2.02	7439-93-2	
Al	0.02	7429-90-5	

IC ICM H01M004-58

INCL 429231900; 429231950; 429221000; 429223000; 429231500; 429224000;

429231600
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 IT 477779-87-6P, Sodium vanadium fluoride phosphate NaVF(PO₄)
 484040-01-9P, Iron lithium magnesium fluoride phosphate FeO_{0.9}Li_{1.25}Mg_{0.1}F_{0.25}(PO₄)₂ 484040-22-4P, Lithium vanadium fluoride phosphate (Li₆V₂F(PO₄)₃) 484040-28-0P
 610272-07-6P 610311-01-8P
 (batteries comprising alkali-transition metal phosphates and preferred electrolytes)

L25 ANSWER 12 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:628392 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 139:166947
 TITLE: Cathode active mass, cathode, secondary nonaqueous-electrolyte battery, and method for its charging and discharging
 INVENTOR(S): Okada, Shigeto; Yamaki, Junichi; Kamibo, Yasushi; Ueno, Mizuki
 PATENT ASSIGNEE(S): Sangaku Renkei Kiko Kyushu Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003229126	A	20030815	JP 2002-24976 -->	20020201
JP 3624205	B2	20050302	JP 2002-24976 -->	20020201

PRIORITY APPLN. INFO.: ED Entered STN: 15 Aug 2003
 AB The title cathode active mass contains a lithium phosphate fluoride compound Li₂-XMP04F (M is a transition metal; X = 0-2). The title battery, equipped with a cathode containing the above active mass, is charged and discharged by using III/II and IV/III valence oxidation-reduction reaction of the transition metal. The battery provides high discharge voltage and energy d.
 IT 484039-84-1, Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))
 (cathode containing lithium transition metal phosphate fluoride for nonaq. battery)
 RN 484039-84-1 HCAPLUS
 CN Cobalt lithium fluoride phosphate (CoLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
F	1		14762-94-8
O4P	1		14265-44-2
Co	1		7440-48-4
Li	2		7439-93-2

IC ICM H01M004-58
 ICS H01M004-02; H01M004-38; H01M004-46; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 484039-84-1, Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))

(cathode containing lithium transition metal phosphate fluoride for
nonaq. battery)

L25 ANSWER 13 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:437518 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 139:278965
 TITLE: Experimental and computational study of the
structure and electrochemical properties of
monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compounds
 AUTHOR(S): Morgan, D.; Ceder, G.; Saidi, M. Y.; Barker, J.;
Swoyer, J.; Huang, H.; Adamson, G.
 CORPORATE SOURCE: Computational Modeling Consultants, Wellesley, MA,
USA
 SOURCE: Journal of Power Sources (2003),
119-121, 755-759
 CODEN: JPSODZ; ISSN: 0378-7753
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 09 Jun 2003
 AB This paper presents a combined computational and exptl. study of the
structural and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ (with a focus
on $\text{M}=\text{V}$). The voltage curve for $x=0-3$ Li is measured exptl. and calculated.
Features of the voltage curve are understood as emerging from site energetics,
Li ordering, and redox couples. These features are found to be largely
independent of alloying and a simple additive model is proposed to analyze the
voltage curve for different cation substitutions. The model is shown to be
very useful for understanding exptl. results for a number of substituted
compds.

IT 204653-31-6, Lithium titanium vanadium phosphate $\text{Li}_3\text{TiV}(\text{PO}_4)_3$
 204653-32-7, Aluminum lithium vanadium phosphate $\text{AlLi}_3\text{V}(\text{PO}_4)_3$
 (exptl. and computational study of crystal structure site occupancy
and electrochem. properties of monoclinic $\text{Li}_x\text{M}_2(\text{PO}_4)_3$ compds. as
battery cathodes)

RN 204653-31-6 HCAPLUS

CN Lithium titanium vanadium phosphate ($\text{Li}_3\text{TiV}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Ti	1	7440-32-6
Li	3	7439-93-2

RN 204653-32-7 HCAPLUS

CN Aluminum lithium vanadium phosphate ($\text{AlLi}_3\text{V}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Al	1	7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

Section cross-reference(s): 72

IT 204653-31-6, Lithium titanium vanadium phosphate $\text{Li}_3\text{TiV}(\text{PO}_4)_3$

204653-32-7, Aluminum lithium vanadium phosphate AlLi₃V(PO₄)₃
 605661-90-3, Lithium vanadium phosphate (Li_{0.25}V₂(PO₄)₃)
 605661-91-4, Iron lithium phosphate (Fe₂Li_{0.25}(PO₄)₃) 605661-92-5
 605661-93-6

(exptl. and computational study of crystal structure site occupancy
 and electrochem. properties of monoclinic Li_xM₂(PO₄)₃ compds. as
 battery cathodes)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 14 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:389054 HCPLUS [Full-text](#)
 DOCUMENT NUMBER: 139:278891
 TITLE: New iron (III) hydroxyl-phosphate with rod-packing
 structure as intercalation materials
 AUTHOR(S): Song, Yanning; Zavalij, Peter Y.; Whittingham, M.
 Stanley
 CORPORATE SOURCE: Department of Chemistry and Institute for
 Materials Research, State University of New York
 at Binghamton, Binghamton, NY, 13902-6016, USA
 SOURCE: Materials Research Society Symposium Proceedings (2003), 756(Solid State Ionics--2002), 249-253
 CODEN: MRSPDH; ISSN: 0272-9172
 PUBLISHER: Materials Research Society
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 21 May 2003
 AB A new Fe hydroxyl-phosphate, H₂Fe₁₄/3(PO₄)₄(OH)₄ was synthesized under
 hydrothermal conditions. In this compound, perpendicular chains formed by the
 face-sharing FeO₆ form rod-packing structures. Only .apprx.60% of the chain
 sites are occupied by Fe atoms, other metals such as Mn, Ni, and Zn, can be
 incorporated into the chain either by filling in the vacancies and/or
 replacing some of the Fe atoms. Reversible insertion and extraction of Li
 into this compound shows it to be an excellent cathode material. At c.d. of
 0.1 mA/cm², 90% of the theor. capacity of 176 mA·h/g can be obtained. The
 capacity was reduced to .apprx.70% for a 10-fold increase of c.d. The
 electrochem. behavior is attributed to the 3-dimensional rod packing structure
 where Li can move freely even at high current densities inside the 3-
 dimensional framework without altering the host structure. Two of the protons
 in the lattice may be exchanged by Li yielding Li₂Fe₁₄/3(PO₄)₄(OH)₄. These Li
 atoms are not removable in electrochem. cycling and similar electrochem.
 properties were found for these 2 compds., suggesting an ion-exchange process
 for the lithiation.
 IT 605685-55-6P, Iron lithium hydroxide phosphate
 (Fe₇Li₃(OH)₆(PO₄)₆)
 (iron(III) hydroxyl-phosphates with rod-packing structures as
 cathodes for lithium batteries)
 RN 605685-55-0 HCPLUS
 CN Iron lithium hydroxide phosphate (Fe₇Li₃(OH)₆(PO₄)₆) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
HO	6	14280-30-9
O4P	6	14265-44-2
Li	3	7439-93-2
Fe	7	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 78

IT 605685-54-9P, Iron hydroxide phosphate ($\text{Fe}_7(\text{OH})_6(\text{HPO}_4)_3(\text{PO}_4)_3$)

605685-55-0P, Iron lithium hydroxide phosphate

($\text{Fe}_7\text{Li}_3(\text{OH})_6(\text{PO}_4)_6$)

(iron(III) hydroxyl-phosphates with rod-packing structures as cathodes for lithium batteries)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 15 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:97868 HCPLUS Full-text

DOCUMENT NUMBER: 138:140078

TITLE: Alkali/transition metal halo- and hydroxy-phosphates and related electrode active materials

INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid; Swoyer, Jeffrey L.

PATENT ASSIGNEE(S): Valence Technology Inc., UK

SOURCE: U.S. Pat. Appl. Publ., 22 pp., Cont.-in-part of U.S. 6,387,568.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030027049	A1	20030206	US 2001-14822 <--	20011026
US 6777132	B2	20040817		
US 6387568	B1	20020514	US 2000-559861 <--	20000427
AT 317157	T	20060215	AT 2001-916649 <--	20010314
TW 503596	B	20020921	TW 2001-90109979 <--	20010426
US 20030013019	A1	20030116	US 2001-45685 <--	20011107
US 6964827	B2	20051115		
US 20020168573	A1	20021114	US 2002-133091 <--	20020426
US 6855462	B2	20050215		
CA 2463872	A1	20030508	CA 2002-2463872 <--	20021018
WO 2003038930	A2	20030508	WO 2002-US33510 <--	20021018
WO 2003038930	A3	20040422		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA,UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR,				

BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002337911	A1	20030512	AU 2002-337911	20021018
<--				
EP 1444744	A2	20040811	EP 2002-773814	20021018
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
CN 1659728	A	20050824	CN 2002-821019	20021018
<--				
JP 2006516172	T	20060622	JP 2003-541083	20021018
<--				
US 20040265695	A1	20041230	US 2004-870135	20040616
<--				
US 7214448	B2	20070508		
US 20060014078	A1	20060119	US 2005-223082	20050909
<--				
US 7270915	B2	20070918		
US 20070009800	A1	20070111	US 2006-531824	20060914
<--				
US 20070190425	A1	20070816	US 2007-734678	20070412
<--				
PRIORITY APPLN. INFO.:			US 2000-559861	A2 20000427
			<--	
			US 2001-14822	A2 20011026
			<--	
			US 2001-45685	A3 20011107
			<--	
			WO 2002-US33510	W 20021018
			<--	
			US 2004-870135	A2 20040616

ED Entered STN: 07 Feb 2003
 AB An electroreactive material comprises: AaMb(XY4)cZd, wherein (a) A is selected from the group consisting of Li, Na, and/or K, and a = 0-8; (b) M is ≥ 1 metal, comprising ≥ 1 metal which is capable of undergoing oxidation to a higher valence state, and b = 1-3; (c) XY4 is selected from the group consisting of X'04-xY'x, X'04-yY'y, X'xS4, and mixts. thereof, where X' is P, As, Sb, Si, and/or Ge; X'' is P, As, Sb, Si, and/or Ge; Y' is halogen, x = 0-3; and y = 0-4; and c = 0-3; (d) Z is OH and/or halogen, d = 0-6; and wherein M, X, Y, Z, a, b, c, d, x, and y are selected so as to maintain the electroneutrality of the compound. Preferred embodiments include those having where c=1, those where c=2, and those where c=3. Preferred embodiments include those where a ≤ 1 and c=1, those where a=2 and c=1, and those where a ≥ 3 and c=3. This invention also provides electrodes comprising an electrode active material of this invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode having a compatible active material; and an electrolyte.
 IT 484039-84-1P, Cobalt lithium fluoride phosphate (CoLi2F(PO4))
 484039-86-3P, Iron lithium fluoride phosphate (FeLi2F(PO4))
 484039-88-5P 484039-91-0P, Lithium nickel fluoride phosphate (Li2NiF(PO4)) 484039-95-4P, Lithium manganese fluoride phosphate (Li2MnF(PO4)) 484039-97-6P, Copper lithium fluoride phosphate (CuLi2F(PO4)) 484040-14-4P, Iron lithium fluoride phosphate (Fe2Li4F(PO4)3)) 484040-15-5P, Lithium vanadium fluoride phosphate (Li4V2F(PO4)3)) 484040-20-2P, Lithium manganese fluoride phosphate (Li5Mn2F2(PO4)3) 484040-21-4P, Lithium vanadium fluoride phosphate (Li6V2F(PO4)3) 484040-27-9P 484040-23-0P (alkali/transition metal halo- and hydroxy-phosphates and related

10/551,935

electrode active materials)
RN 484039-84-1 HCPLUS
CN Cobalt lithium fluoride phosphate (CoLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Co	1	7440-48-4
Li	2	7439-93-2

RN 484039-86-3 HCPLUS
CN Iron lithium fluoride phosphate (FeLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Li	2	7439-93-2
Fe	1	7439-89-6

RN 484039-88-5 HCPLUS
CN Iron lithium magnesium fluoride phosphate (Fe_{0.9}Li₂Mg_{0.1}F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mg	0.1	7439-95-4
Li	2	7439-93-2
Fe	0.9	7439-89-6

RN 484039-91-0 HCPLUS
CN Lithium nickel fluoride phosphate (Li₂NiF(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Ni	1	7440-02-0
Li	2	7439-93-2

RN 484039-95-4 HCPLUS
CN Lithium manganese fluoride phosphate (Li₂MnF(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2

RN 484039-97-6 HCPLUS
CN Copper lithium fluoride phosphate (CuLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Cu	1	7440-50-8
Li	2	7439-93-2

RN 484040-14-4 HCPLUS
CN Iron lithium fluoride phosphate (Fe₂Li₄F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	3	14265-44-2
Li	4	7439-93-2
Fe	2	7439-89-6

RN 484040-15-5 HCPLUS
CN Lithium vanadium fluoride phosphate (Li₄V₂F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	3	14265-44-2
V	2	7440-62-2
Li	4	7439-93-2

RN 484040-20-2 HCPLUS
CN Lithium manganese fluoride phosphate (Li₅Mn₂F₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	2	14762-94-8
O ₄ P	3	14265-44-2
Mn	2	7439-96-5
Li	5	7439-93-2

RN 484040-22-4 HCPLUS
CN Lithium vanadium fluoride phosphate (Li₆V₂F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	3	14265-44-2
V	2	7440-62-2
Li	6	7439-93-2

RN 484040-27-9 HCPLUS
CN Aluminum antimony lithium vanadium fluoride oxide phosphate (Al₁Sb_{0.5}Li₄VFO₂(PO₄)_{0.25}) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O		2		17778-80-2
F		1		14762-94-8
O4P		0.25		14265-44-2
V		1		7440-62-2
Sb		0.5		7440-36-0
Li		4		7439-93-2
Al		1		7429-90-5

RN 484040-28-0 HCPLUS
CN Aluminum cobalt lithium magnesium fluoride phosphate
(A10.02Co0.9Li2.02Mg0.05F(PO4)) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
F		1		14762-94-8
O4P		1		14265-44-2
Co		0.9		7440-48-4
Mg		0.05		7439-95-4
Li		2.02		7439-93-2
Al		0.02		7429-90-5

IC ICM H01M004-58
ICS C01B017-98; C01B025-10; C01B033-08
INCL 429231950; 429231900; 429221000; 429223000; 429224000; 429220000;
429231500; 429222000; 423332000; 423341000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)
Section cross-reference(s): 49
IT 52934-02-8P, Cobalt lithium fluoride phosphate 52934-08-4P, Lithium
nickel fluoride phosphate 257892-19-6P, Sodium vanadium fluoride
phosphate (Na3V2F3(PO4)2) 477779-87-6P, Sodium vanadium fluoride
phosphate NaVFPO4 477779-89-8P, Lithium sodium vanadiumfluoride
phosphate (Li0.95Na0.05VF(PO4)) 484039-84-1P, Cobalt lithium
fluoride phosphate (CoLi2F(PO4)) 484039-86-3P, Iron lithium
fluoride phosphate (FeLi2F(PO4)) 484039-86-5P
484039-91-6P, Lithium nickel fluoride phosphate (Li2NiF(PO4))
484039-93-2P, Iron lithium fluoride phosphate 484039-95-4P,
Lithium manganese fluoride phosphate (Li2MnF(PO4))
484039-97-6P, Copper lithium fluoride phosphate (CuLi2F(PO4))
484040-01-9P, Iron lithium magnesium fluoride phosphate
(Fe0.9Li1.25Mg0.1F0.25(PO4)) 484040-04-2P, Sodium vanadium fluoride
phosphate (Na1.2VF1.2(PO4)) 484040-06-4P, Chromium sodium fluoride
phosphate 484040-08-6P, Manganese sodium fluoride phosphate
(MnNaF(PO4)) 484040-10-0P, Cobalt sodium fluoride phosphate
(CoNaF(PO4)) 484040-12-2P, Lithium sodium vanadiumfluoride phosphate
(Li0.1Na0.9VF(PO4)) 484040-13-3P, Sodium vanadium hydroxide
phosphate NaVOHPO4 484040-14-4P, Iron lithium fluoride
phosphate (Fe2Li4F(PO4)3) 484040-15-5P, Lithium vanadium
fluoride phosphate (Li4V2F(PO4)3) 484040-20-2P, Lithium
manganese fluoride phosphate (Li5Mn2F2(PO4)3) 484040-22-4P,
Lithium vanadium fluoride phosphate (Li6V2F(PO4)3) 484040-25-7P,
Chromium lithium sodium fluoride phosphate silicate
(CrLiNa0.2F(PO4)0.8(SiO4)0.2) 484040-27-9P
493040-28-0P 493025-03-9P, Lithium manganese fluoride
phosphate 493025-04-0P, Copper lithium fluoride phosphate
(alkali/transition metal halo- and hydroxy-phosphates and related
electrode active materials)

REFERENCE COUNT: 134 THERE ARE 134 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE

RE FORMAT

L25 ANSWER 16 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2003:42884 HCPLUS Full-text
 DOCUMENT NUMBER: 138:92874
 TITLE: Alkali/transition metal halo- and hydroxy-phosphates and related electrode active materials
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid; Swoyer, Jeffery L.
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 22 pp., Cont.-in-part of U. S. 6,387,568.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 4
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030013019	A1	20030116	US 2001-45685 <--	20011107
US 6964827	B2	20051115		
US 6387568	B1	20020514	US 2000-559861 <--	20000427
US 20030027049	A1	20030206	US 2001-14822 <--	20011026
US 6777132	B2	20040817		
US 20050142056	A1	20050630	US 2005-905649 <--	20050114
US 7261977	B2	20070828		
US 20060014078	A1	20060119	US 2005-223082 <--	20050909
US 7270915	B2	20070918		
PRIORITY APPLN. INFO.:			US 2000-559861 <--	A2 20000427
			US 2001-14822 <--	A2 20011026
			US 2001-45685 <--	A1 20011107
			US 2002-133091 <--	A1 20020426

ED Entered STN: 17 Jan 2003

AB Electrode active materials comprise lithium or other alkali metals, a transition metal, a phosphate or similar moiety, and a halogen or hydroxyl moiety. Such electrode actives include those of the formula: AaMb(XY4)cZd wherein (a) A is selected from the group consisting of Li, Na, K, and mixts. thereof, and 0<a≤6; (b) M comprises one or more metals, comprising at least one metal which is capable of undergoing oxidation to a higher valence state, and 1≤b≤3; (c) XY4 is selected from the group consisting of X'04-xY'Xx, X'04-yY'2y , X''S4, and mixts. thereof, where X' is P, As, Sb, Si, Ge, S, and mixts. thereof; X'' is P, As, Sb, Si, Ge and mixts. thereof; Y' is halogen; 0≤x<3; and 0<y<4; and 0<c≤3; (d) Z is OH, halogen, or mixts. thereof, and 0<d≤6; and wherein M, X, Y, Z, a, b, c, d, x and y are selected so as to maintain electroneutrality of the compound. In a preferred embodiment, M comprises two or more transition metals from Groups 4 to 11 of the Periodic Table. In another preferred embodiment, M comprises M'1-mM'm, where M' is at least one transition metal from Groups 4 to 11 of the Periodic Table; M' is

at least one element from Groups 2, 3, 12, 13, or 14 of the Periodic Table, and $0 < m < 1$. Preferred embodiments include those having where $c=1$, those where $c=2$, and those where $c=3$. Preferred embodiments include those where $a \leq 1$ and $c=1$, those where $a=2$ and $c=1$, and those where $a \geq 3$ and $c=3$. This invention also provides electrodes comprising an electrode active material of this invention, and batteries that comprise a first electrode having an electrode active material of this invention; a second electrode having a compatible active material; and an electrolyte.

IT 484039-84-1, Cobalt lithium fluoride phosphate (CoLi₂F(PO₄))

484039-86-3, Iron lithium fluoride phosphate (FeLi₂F(PO₄))

484039-88-5

(alkali/transition metal halo- and hydroxy-phosphates and related electrode active materials)

RN 484039-84-1 HCPLUS

CN Cobalt lithium fluoride phosphate (CoLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Co	1	7440-48-4
Li	2	7439-93-2

RN 484039-86-3 HCPLUS

CN Iron lithium fluoride phosphate (FeLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Li	2	7439-93-2
Fe	1	7439-89-6

RN 484039-88-5 HCPLUS

CN Iron lithium magnesium fluoride phosphate (Fe_{0.9}Li₂Mg_{0.1}F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mg	0.1	7439-95-4
Li	2	7439-93-2
Fe	0.9	7439-89-6

IT 484039-91-0P, Lithium nickel fluoride phosphate (Li₂NiF(PO₄))

484039-95-4P, Lithium manganese fluoride phosphate

(Li₂MnF(PO₄)) 484039-97-6P, Copper lithium fluoride

phosphate (CuLi₂F(PO₄)) 484040-14-4P, Iron lithium fluoride

phosphate (Fe₂Li₂F(PO₄)) 484040-15-5P, Lithium vanadium

fluoride phosphate (Li₄V₂F(PO₄)) 484040-20-2P, Lithium

manganese fluoride phosphate (Li₅Mn₂F₂(PO₄)) 484040-32-4P,

Lithium vanadium fluoride phosphate (Li₆V₂F(PO₄))

484040-27-9P 484040-28-0P

(alkali/transition metal halo- and hydroxy-phosphates and related electrode active materials)

RN 484039-91-0 HCPLUS

10/551,935

CN Lithium nickel fluoride phosphate (Li₂NiF(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Ni	1	7440-02-0
Li	2	7439-93-2

RN 484039-95-4 HCPLUS

CN Lithium manganese fluoride phosphate (Li₂MnF(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2

RN 484039-97-6 HCPLUS

CN Copper lithium fluoride phosphate (CuLi₂F(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	1	14265-44-2
Cu	1	7440-50-8
Li	2	7439-93-2

RN 484040-14-4 HCPLUS

CN Iron lithium fluoride phosphate (Fe₂Li₄F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	3	14265-44-2
Li	4	7439-93-2
Fe	2	7439-89-6

RN 484040-15-5 HCPLUS

CN Lithium vanadium fluoride phosphate (Li₄V₂F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O ₄ P	3	14265-44-2
V	2	7440-62-2
Li	4	7439-93-2

RN 484040-20-2 HCPLUS

CN Lithium manganese fluoride phosphate (Li₅Mn₂F(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number

10/551,935

F		2		14762-94-8
O4P		3		14265-44-2
Mn		2		7439-96-5
Li		5		7439-93-2

RN 484040-22-4 HCPLUS

CN Lithium vanadium fluoride phosphate (Li6V2F(PO4)3) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O4P	3	14265-44-2
V	2	7440-62-2
Li	6	7439-93-2

RN 484040-27-9 HCPLUS

CN Aluminum antimony lithium vanadium fluoride oxide phosphate
(AlSb0.5Li4VF02(PO4)0.25) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
F	1	14762-94-8
O4P	0.25	14265-44-2
V	1	7440-62-2
Sb	0.5	7440-36-0
Li	4	7439-93-2
Al	1	7429-90-5

RN 484040-28-0 HCPLUS

CN Aluminum cobalt lithium magnesium fluoride phosphate
(Al0.02Co0.9Li2.0Mg0.05F(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
F	1	14762-94-8
O4P	1	14265-44-2
Co	0.9	7440-48-4
Mg	0.05	7439-95-4
Li	2.02	7439-93-2
Al	0.02	7429-90-5

IC ICM H01M004-58

ICS C01B025-45; C01B025-30

INCL 429231900; X42-923.195; X42-922.1; X42-922.3; X42-922.0; X42-922.4;
X42-923.15; X42-923.16; X42-330.6CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
484039-84-1, Cobalt lithium fluoride phosphate (CoLi2F(PO4))
484039-85-3, Iron lithium fluoride phosphate (FeLi2F(PO4))
484039-89-5(alkali/transition metal halo- and hydroxy-phosphates and related
electrode active materials)IT 52934-02-8P, Cobalt lithium fluoride phosphate 477779-87-6P, Sodium
vanadium fluoride phosphate NaVFPO4 484039-91-0P, Lithium
nickel fluoride phosphate (Li2NiF(PO4)) 484039-93-2P, Iron lithium

fluoride phosphate 484039-95-4P, Lithium manganese fluoride phosphate (Li₂MnF(PO₄)) 484039-57-6P, Copper lithium fluoride phosphate (CuLi₂F(PO₄)) 484040-01-0P, Sodium vanadium fluoride phosphate (Na_{1.2}V_{1.2}(PO₄)) 484040-06-4P, Chromium sodium fluoride phosphate 484040-08-6P, Manganese sodium fluoride phosphate (MnNaF(PO₄)) 484040-10-0P, Cobalt sodium fluoride phosphate (CoNaF(PO₄)) 484040-12-2P 484040-13-3P, Sodium vanadium hydroxide phosphate (NaV(OH)(PO₄)) 484040-14-4P, Iron lithium fluoride phosphate (Fe2Li4F(PO₄)₃) 484040-15-5P, Lithium vanadium fluoride phosphate (Li₄V₂F(PO₄)₃) 484040-20-3P, Lithium manganese fluoride phosphate (Li₅Mn₂F₂(PO₄)₃) 484040-22-4P, Lithium vanadium fluoride phosphate (Li₆V₂F(PO₄)₃) 484040-25-7P 484040-27-9P 484040-28-0P

(alkali/transition metal halo- and hydroxy-phosphates and related electrode active materials)

REFERENCE COUNT: 127 THERE ARE 127 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 17 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:781946 HCPLUS Full-text

DOCUMENT NUMBER: 138:290280

TITLE: X-Ray Absorption Study of LixMnyFel-yPO₄ (0

$\leq x \leq 1, 0 < y \leq 1$)

AUTHOR(S): Li, Guohua; Kudo, Yoshihiro; Liu, Kuang-Yu; Azuma, Hideto; Tohda, Masayuki

CORPORATE SOURCE: Sony Corporation, Nishi Battery Laboratories, Kanagawa, 243-0021, Japan

SOURCE: Journal of the Electrochemical Society (2002), 149(11), A1414-A1418

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 14 Oct 2002

AB C-containing cathode materials Li_xMnyFel-yPO₄ ($0 < y \leq 1$) were prepared by a solid-state reaction by adding C black to the synthetic precursors. The local structural change of electrochem. prepared Li_xMnyFel-yPO₄ ($0 \leq x \leq 1, 0 < y \leq 1$) samples was studied by x-ray absorption spectroscopy. The local structural change of Mn is completely reversible during the charge-discharge processes. According to the anal. of K-edge x-ray absorption fine structure, no significant difference is observed in the local structure of Mn in the charged state for the whole range of Mn contents.

IT 213467-46-0, Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) (x-ray absorption spectroscopy of iron lithium manganese phosphate cathodes for lithium batteries)

RN 213467-46-0 HCPLUS

CN Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	2	14265-44-2	
Mn	1	7439-96-5	
Li	2	7439-93-2	
Fe	1	7439-89-6	

CC 52-2 (Electrochemical, Radiational, and Thermal Energy

Technology)

Section cross-reference(s): 73

IT 13826-59-0, Lithium manganese phosphate (LiMnPO₄) 213467-46-0
, Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) 300858-61-1, Iron
lithium manganese phosphate (Fe0.4LiMn0.6(PO₄)) 371145-95-8, Iron
lithium manganese phosphate (Fe0.25LiMn0.75(PO₄)) 407629-83-8
412351-36-1, Iron lithium manganese phosphate (Fe0.9LiMn0.1(PO₄))
464174-82-1, Iron lithium manganese phosphate ((Fe,Mn)Li0-1(PO₄))
464174-83-2, Iron lithium manganese phosphate (Fe0.6LiMn0.4(PO₄))
474903-00-9, Iron lithium manganese phosphate (Fe0.3LiMn0.7(PO₄))
474903-03-2, Iron lithium manganese phosphate (Fe0.1LiMn0.9(PO₄))
474903-04-3, Iron lithium manganese phosphate (Fe0.75LiMn0.25(PO₄))
(x-ray absorption spectroscopy of iron lithium manganese phosphate
cathodes for lithium batteries)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 18 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2002:734259 HCPLUS Full-text
DOCUMENT NUMBER: 137:265592
TITLE: secondary lithium battery
INVENTOR(S): Fujita, Shigeru; Akashi, Hiroyuki; Adachi, Momoe;
Shibamoto, Goro
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002279989	A	20020927	JP 2001-77086	20010316

PRIORITY APPLN. INFO.: JP 2001-77086 20010316
<--

ED Entered STN: 27 Sep 2002

AB The battery has a Li intercalating and depositing anode and a oxide cathode active mass containing Li, P and ≥1 of Fe, Mn and Co. The cathode may also contain a 2nd oxide active mass containing Li and ≥1 of Co, Ni, and Mn. The anode active mass is selected from Li intercalating carbonaceous materials and metals, semiconductors, alloys, and compds. capable of alloying with Li.

IT 213467-46-0, Iron lithium manganese phosphate [FeLi₂Mn(PO₄)₂] (compns. of oxide cathodes for secondary lithium batteries with lithium intercalating and depositing anodes)

RN 213467-46-0 HCPLUS

CN Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	2	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2
Fe	1	7439-89-6

IC ICM H01M004-58

ICS H01M004-02; H01M004-38; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO₂) 15365-14-7, Iron lithium phosphate (FeLiPO₄) 113066-89-0, Cobalt lithium nickel oxide (Co_{0.2}LiNi_{0.8}O₂) 213467-46-0, Iron lithium manganese phosphate [FeLi₂Mn(PO₄)₂] (compns. of oxide cathodes for secondary lithium batteries with lithium intercalating and depositing anodes)

L25 ANSWER 19 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2002:688501 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:203995
 TITLE: Method of preparation and battery use of lithium based phosphates
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: U.S., 25 pp., Cont.-in-part of U.S. 5,871,866.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6447951	B1	20020910	US 1998-195961 <--	19981119
CA 2351332	A1	20000602	CA 1999-2351332 <--	19991005
WO 2000031812	A1	20000602	WO 1999-US23074 <--	19991005
WO 2000031812	A9	20020822		
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JE, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9965076	A	20000613	AU 1999-65076 <--	19991005
AU 764529	B2	20030821		
EP 1135819	A1	20010926	EP 1999-953046 <--	19991005
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002530835	T	20020917	JP 2000-584544 <--	19991005
MX 2001PA04931	A	20040129	MX 2001-PA4931 <--	20010516
PRIORITY APPLN. INFO.:			US 1996-717919 <--	A2 19960923
			US 1998-195961 <--	A 19981119
			WO 1999-US23074 <--	W 19991005

ED Entered STN: 11 Sep 2002

AB A lithium ion battery comprises: a first electrode having an active material in a first condition of the nominal general formula Li_{3-x}M^yM^{'y}(PO₄)₃, x =

0, 0< y < 2 and in a second condition of the nominal general formula: Li_{3-x}M'_yM''_{2-y}(PO₄)₃, 0 < x ≤ 3, wherein M' is Zr or Ti and M'' is a metal selected from V, Cr, Mn, Fe, Co, Ni, Cu, Sn, Pb, Mo, W, Cd, Zn, and Pd, with the proviso that when M' is Ti, M'' is not Fe; a second electrode which is a counter-electrode to the first electrode; and an electrolyte between the electrodes.

IT 204653-32-7P, Aluminum lithium vanadium phosphate AlLi₃V(PO₄)₃
(method of preparation and battery use of lithium based phosphates)

RN 204653-32-7 HCAPLUS

CN Aluminum lithium vanadium phosphate (AlLi₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Al	1	7429-90-5

IC ICM H01M004-58

INCL 429218100

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49

IT 84159-18-2P, Lithium vanadium phosphate Li₃V₂(PO₄)₃

204653-32-7P, Aluminum lithium vanadium phosphate AlLi₃V(PO₄)₃

270258-22-5P, Lithium manganese zirconium phosphate Li₃Mn₂r(PO₄)₃

(method of preparation and battery use of lithium based phosphates)

L25 ANSWER 20 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:558477 HCAPLUS Full-text

DOCUMENT NUMBER: 138:92665

TITLE: A neutron powder diffraction study of electrochemically lithiated R-Li_{3+x}Fe₂(PO₄)₃ for x = 1.8

AUTHOR(S): Eyob, Paulos; Andersson, Anna S.; Thomas, John O.

CORPORATE SOURCE: Department of Materials Chemistry, Angstrom Laboratory, Uppsala University, Uppsala, SE-751 21, Swed.

SOURCE: Journal of Materials Chemistry (2002), 12(8), 2343-2347

CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 29 Jul 2002

AB The electrochem. lithiated form of R-Li₃Fe₂(PO₄)₃, synthesized by ion exchange of fine powders of Na₃Fe₂(PO₄)₃ in a concentrated aqueous solution of LiNO₃ at a slightly elevated temperature (40 °C), has been investigated by a combination of ex situ X-ray and neutron diffraction to probe particularly the lithium-ion distribution in the structure. Li_{3+x}Fe₂(PO₄)₃ samples were extracted from discharged electrochem. cells with a Li-metal anode; their structure was refined by the Rietveld method. Approx. 1.8 Li per formula unit can be inserted reversibly into the structure, corresponding to the reduction of almost all Fe³⁺ to Fe²⁺. Ex situ X-ray powder diffraction shows the Fe₂(PO₄)₃ framework to remain intact during lithiation. The Li(18f) site in R-Li₃Fe₂(PO₄)₃ (space group: R3[cmh.macr]) is totally vacated in R-Li_{3+x}Fe₂(PO₄)₃, 0 ≤ x ≤ 1.8, with the lithium ions moving into two new general (18f) positions, Li(1) and Li(2), with 74(4)% and 86(4)% occupation, resp. This corresponds to the Li⁺ ions moving cooperatively from pairs of layers

(alternate sepn.: 2.2 and 5.4 Å) for $x = 0$ to equally spaced layers (separation: 3.8 Å) for $x = 1.8$.

IT 483644-73-1, Iron lithium phosphate (Fe2Li4.8(PO4)3)
 (neutron powder diffraction study of electrochem. lithiated
 R-Li3+xFe2(PO4)3 for $x = 1.8$)

RN 483644-73-1 HCAPLUS

CN Iron lithium phosphate (Fe2Li4.8(PO4)3) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Li	4.8	7439-93-2
Fe	2	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

IT 483644-73-1, Iron lithium phosphate (Fe2Li4.8(PO4)3)
 (neutron powder diffraction study of electrochem. lithiated
 R-Li3+xFe2(PO4)3 for $x = 1.8$)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 21 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:505613 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:355365

TITLE: Optimized LiMnyFel-yPO4 as the cathode for lithium
 batteries

AUTHOR(S): Li, Guohua; Azuma, Hideto; Tohda, Masayuki

CORPORATE SOURCE: Nishi Battery Laboratories, Sony Corporation,
 Atsugi, 243-0021, Japan

SOURCE: Journal of the Electrochemical Society (2002), 149(6), A743-A747

CODEN: JESOAN; ISSN: 0013-4651

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 07 Jul 2002

AB A new synthesis route has been developed for LiMnyFel-yPO4 ($y = 0-0.9$) powders. A significant improvement in electrode performance has been achieved by adding carbon black to the synthetic precursor. The carbon-containing LiMnyFel-yPO4 was synthesized under various conditions and the performance of the cathodes was evaluated using coin cells. The samples were characterized by X-ray diffraction, particle-size distribution measurements, scanning electron microscope observations, and BET surface area measurements. The addition of carbon black limited the particle size growth and enabled high electronic conductivity. Another advantage is simplification of electrode preparation, only needs the cathode powder to be mixed with binder. At large Mn content ($y = 0.75$), a high capacity of 164 mAh/g has been achieved with an average discharge voltage of 3.63 V (595 Wh/kg) at room temperature. In addition, LiMnyFel-yPO4 demonstrated excellent storage performance at elevated temps. The thermal stability of the charged cathode was evaluated by thermogravimetric and differential scanning calorimetric thermal analyses.

IT 213467-46-0, Iron lithium manganese phosphate (FeLi2Mn(PO4)2)
 (cathode; optimized high-manganese-content carbon black-containing
 lithium manganese iron phosphates as cathodes for rechargeable
 lithium batteries)

RN 213467-46-0 HCAPLUS

CN Iron lithium manganese phosphate (FeLi2Mn(PO4)2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	2	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 15365-14-7, Iron lithium phosphate (FeLiPO₄) 213467-46-0,
Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) 300858-61-1
371145-95-8 407629-83-8 407640-52-2, Iron lithium manganese
phosphate (Fe0.1-LiMn0.9(PO₄)) 412351-36-1, Iron lithium
manganese phosphate (Fe0.9LiMn0.1(PO₄)) 464174-83-2 464174-90-1
474902-99-3, Iron lithium manganese phosphate (Fe0.35LiMn0.65(PO₄))
474903-00-9, Iron lithium manganese phosphate (Fe0.3LiMn0.7(PO₄))
474903-03-2, Iron lithium manganese phosphate (Fe0.1LiMn0.9(PO₄))
474903-04-3
(cathode; optimized high-manganese-content carbon black-containing
lithium manganese iron phosphates as cathodes for rechargeable
lithium batteries)

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 22 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2002:316793 HCPLUS Full-text
DOCUMENT NUMBER: 137:235112
TITLE: A reversible lithium intercalation process in an
ReO₃-type structure PNb9025
AUTHOR(S): Patoux, Sébastien; Dolle, Mickael; Rousse,
Gwenaelle; Masquelier, Christian
CORPORATE SOURCE: Laboratoire de Reactivite et de Chimie des
Solides, CNRS UMR 6007, Université de Picardie
Jules Verne, Amiens, 80039, Fr.
SOURCE: Journal of the Electrochemical Society (2002), 149(4), A391-A400
CODEN: JESOAN; ISSN: 0013-4651
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 28 Apr 2002
AB Among the large family of Wadsley-Roth-type phases, PNb9025 presents, as other
shear structures such as H-Nb205, GeNb18047, and VNb9025, a peculiar
arrangement of 3 + 3 + ∞ ReO₃-type blocks connected through XO₄ tetrahedra.
The crystal structure was redetd. by combined Rietveld refinements of X-ray
and neutron powder diffraction data, for the first time in the tetragonal
space group I4 with $a = 15.615(1)$ Å and $c = 3.829(1)$ Å. The electrochem.
insertion of lithium into LixPNb9025 reaches a value of $x = 13.5$, between 3.0
and 1.0 V vs. Li⁺/Li at a slow cycling rate. Within this voltage window, in
situ X-ray diffraction reveals that the reversible intercalation of lithium
occurs through three single- and two two-phase regions. The variation of the
lattice parameters as a function of x indicates a global change of $\Delta V/V = +10\%$
associated with the reduction of Nb⁵⁺ to Nb⁴⁺ and then partly to Nb³⁺. At
voltages lower than 1 V vs. Li⁺/Li, extra irreversible phenomena, such as
electrolyte and/or carbon reduction were identified but, remarkably, highly
crystalline particles of LixPNb9025 remain unaltered when discharging the cell
for prolonged time down to 0.02 V vs. Li⁺/Li. The behavior of LixPNb9025 is

very similar to that of H-LixNb205 (LixNbNb9025) but different to that of LixNb9025 where irreversible reduction of V5+ to V2+ (in tetrahedral coordination) takes place.

IT 459412-78-3, Lithium niobium oxide phosphate
(Li_{6.3}Nb₉O₂₁(PO₄))

(formation and properties of; reversible lithium intercalation process in an ReO₃-type structure PNb9025 in secondary batteries)

RN 459412-78-3 HCPLUS

CN Lithium niobium oxide phosphate (Li_{6.3}Nb₉O₂₁(PO₄)) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
O	21		17778-80-2
O ₄ P	1		14265-44-2
Nb	9		7440-03-1
Li	6.3		7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 75

IT 459412-77-2, Lithium niobium oxide phosphate (Li_{8.8}Nb₅O₂₁(PO₄))

459412-78-3, Lithium niobium oxide phosphate
(Li_{6.3}Nb₉O₂₁(PO₄))

(formation and properties of; reversible lithium intercalation process in an ReO₃-type structure PNb9025 in secondary batteries)

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 23 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:256645 HCPLUS Full-text

DOCUMENT NUMBER: 136:297382

TITLE: Carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes

INVENTOR(S): Armand, Michel; Gauthier, Michel; Magnan, Jean-Francois; Ravet, Nathalie

PATENT ASSIGNEE(S): Hydro-Quebec, Can.

SOURCE: PCT Int. Appl., 78 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002027824	A1	20020404	WO 2001-CA1350	20010921

<--

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UC, ZW, AT, BE, CH,
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG

CA 2320661	A1	20020326	CA 2000-2320661	20000926
			<--	
CA 2423129	A1	20020404	CA 2001-2423129	20010921
			<--	
AU 2001093569	A	20020408	AU 2001-93569	20010921
			<--	
EP 1325526	A1	20030709	EP 2001-973907	20010921
			<--	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004509058	T	20040325	JP 2002-531518	20010921
			<--	
US 20040086445	A1	20040506	US 2003-362764	20030619
			<--	
US 7285260	B2	20071023		
US 20070134554	A1	20070614	US 2007-655084	20070119
			<--	
PRIORITY APPLN. INFO.:			CA 2000-2320661	A 20000926
			<--	
			WO 2001-CA1350	W 20010921
			<--	
			US 2003-362764	A1 20030619
			<--	

ED Entered STN: 05 Apr 2002

AB Carbon-coated redox materials suitable for use in battery electrodes consist of a core surrounded by a coating, or interconnected by carbon crosslinks, in which the core includes a composition of formula $\text{Li}_x\text{M}_1\text{-yM}'_y(\text{XO}_4)_n$, in which $y = 0-0.6$, $x = 0-2$, $n = 0-1.5$; M is a transition metal; and M' is an element of fixed valence selected from Mg²⁺, Ca²⁺, Al³⁺, and Zn²⁺, and X is S, P, and Si. Synthesis of the materials is carried out by reacting a balanced mixture of appropriate precursors in a reducing atmospheric, to adjust the valence of the transition metals, in the presence of a carbon source, which is then pyrolyzed. The resulting products exhibit an excellent elec. conductivity and a highly enhanced chemical activity.

IT 213467-46-0, Iron lithium manganese phosphate ($\text{FeLi}_2\text{Mn}(\text{PO}_4)_2$)
(electrodes containing; carbon-coated or carbon-crosslinked redox
materials with transition metal-lithium oxide core for use as
battery electrodes)

RN 213467-46-0 HCAPLUS

CN Iron lithium manganese phosphate ($\text{FeLi}_2\text{Mn}(\text{PO}_4)_2$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	2	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2
Fe	1	7439-89-6

IT 407640-60-2, Iron lithium manganese phosphate sulfate
($\text{Fel-2LiI-2MnO-1[(PO}_4), (\text{SO}_4)]$) 407640-61-3, Iron lithium
titanium phosphate ($(\text{Fe}, \text{Ti})\text{Li}_0.5-2(\text{PO}_4)1.5$)
(metal source; carbon-coated or carbon-crosslinked redox materials
with transition metal-lithium oxide core for use as battery
electrodes)

RN 407640-60-2 HCAPLUS

CN Iron lithium manganese phosphate sulfate ($\text{Fel-2LiI-2MnO-1[(PO}_4), (\text{SO}_4)]$) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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| Registry Number

O4S	0 - 1	14808-79-8
O4P	0 - 1	14265-44-2
Mn	0 - 1	7439-96-5
Li	1 - 2	7439-93-2
Fe	1 - 2	7439-89-6

RN 407640-61-3 HCAPLUS

CN Iron lithium titanium phosphate ((Fe,Ti)Li0.5-2(PO4)1.5) (9CI) (CA INDEX NAME)

Component | Ratio | Component
| | Registry Number

O4P	1.5	14265-44-2
Ti	0 - 1	7440-32-6
Li	0.5 - 2	7439-93-2
Fe	0 - 1	7439-89-6

IC ICM H01M004-48

ICS C01B025-37; C01B033-20; H01M004-58; H01M004-62; C01B017-96

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7439-89-6D, Iron, mixed oxides 7439-96-5D, Manganese, mixed oxides 7440-02-0D, Nickel, mixed oxides 7440-32-6D, Titanium, mixed oxides 7440-47-3D, Chromium, mixed oxides 7440-48-4D, Cobalt, mixed oxides 7440-50-8D, Copper, mixed oxides 7440-62-2D, Vanadium, mixed oxides 13816-45-0, Triphylite 15365-14-7, Iron lithium phosphate (FeLi₂Mn(PO₄)₂) 213467-46-9, Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂) (electrodes containing; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

IT 546-89-4, Lithium acetate 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 1309-37-1, Ferric oxide, reactions 1310-65-2, Lithium hydroxide 1313-13-9, Manganese dioxide, reactions 1314-62-1, Vanadium pentoxide, reactions 1317-61-9, Magnetite, reactions 10045-86-0, Ferric phosphate 10102-24-6, Lithium silicate (Li₂SiO₃) 10377-48-7, Lithium sulfate 10377-52-3, Lithium phosphate (Li₃PO₄) 10421-48-4, Ferric nitrate 12057-24-8, Lithium oxide, reactions 12627-14-4 13453-80-0, Lithium dihydrogen phosphate 63985-45-5, Lithium orthosilicate 407640-52-2, Iron lithium manganese phosphate (Fe_{0.1}-LiMn₀-0.9(PO₄)) 407640-53-3, Iron lithium magnesium phosphate (Fe_{0.7}-LiMg₀-0.3(PO₄)) 407640-54-4, Calcium iron lithium phosphate (Ca₀-0.3Fe_{0.7}-1Li(PO₄)) 407640-55-5 407640-56-6, Iron lithium phosphate silicate (FeLi₁-1.9(PO₄)) 0.1-1(SiO₄) 0-0.9) 407640-57-7 407640-58-8, Iron lithium manganese phosphate sulfate (Fe_{0.1}Li₁-1.2Mn₀-0.2[(PO₄),(SO₄)]) 407640-59-9, Iron lithium manganese phosphate ((Fe,Mn)Li₁-1.6(PO₄)) 407640-60-2, Iron lithium manganese phosphate sulfate (Fe₁-2Li₁-2Mn₀-1[(PO₄),(SO₄)]) 407640-61-3, Iron lithium titanium phosphate ((Fe,Ti)Li0.5-2(PO₄)1.5) (metal source; carbon-coated or carbon-crosslinked redox materials with transition metal-lithium oxide core for use as battery electrodes)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 2002:256644 HCPLUS Full-text
 DOCUMENT NUMBER: 136:297381
 TITLE: Method for synthesis of carbon-coated redox materials with controlled size
 INVENTOR(S): Armand, Michel; Gauthier, Michel; Magnan, Jean-Francois; Ravet, Nathalie
 PATENT ASSIGNEE(S): Hydro-Quebec, Can.
 SOURCE: PCT Int. Appl., 83 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: French
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002027823	A1	20020404	WO 2001-CA1349	20010921 <--
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2320661	A1	20020326	CA 2000-2320661	20000926 <--
CA 2422446	A1	20020404	CA 2001-2422446	20010921 <--
AU 2001093568	A	20020408	AU 2001-93568	20010921 <--
EP 1325525	A1	20030709	EP 2001-973906	20010921 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR JP 2004509447	T	20040325	JP 2002-531517	20010921 <--
US 20040033360	A1	20040219	US 2003-362763	20030619 <--
PRIORITY APPLN. INFO.:			CA 2000-2320661	A 20000926 <--
			WO 2001-CA1349	W 20010921 <--

ED Entered STN: 05 Apr 2002
 AB Carbon-coated redox materials suitable for use as battery electrodes and for fabrication of electrochromic materials, consist of compns. of formulas C-LixM_{1-y}(XO₄)_n or LixM_{1-y}M'_y(XO₄)_n, in which: y = 0-0.6; x = 0-2; n = 1-1.5; M is a transition metal or a mixture of first-row transition metals; M' is a fixed-valent metal ion selected from Mg²⁺, Ca²⁺, Al³⁺, or Zn²⁺; and X is S, P, and Si. The resulting materials consist of particles coated with a conductive carbon layer. The compns. are prepared by reacting a balanced mixture of precursors in the appropriate proportions, including a pyrolysis step for the carbon-producing compound(s), such that the materials form a powdered composition with the desired formula, that has an elec. conductivity of >10⁻⁸ S/cm when compacted at 3750 kg/cm².
 IT 213467-46-0P, Iron lithium manganese phosphate (FeLi₂Mn(PO₄)₂)
 redox cathode containing; synthesis of carbon-coated redox materials

for use as battery cathodes and in electrochromic devices)
 RN 213467-46-0 HCAPLUS
 CN Iron lithium manganese phosphate ($\text{FeLi}_2\text{Mn}(\text{PO}_4)_2$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	2	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2
Fe	1	7439-89-6

IC ICM H01M004-48
 ICS H01M004-58; H01M004-62; C01B025-37; C01B033-20
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 Section cross-reference(s): 72
 IT 7429-90-5P, Aluminum, uses 7439-95-4P, Magnesium, uses 7440-66-6P,
 Zinc, uses 7440-70-2P, Calcium, uses 13816-45-0P, Triphyllite
 15365-14-7P, Iron lithium phosphate ($\text{FeLi}_2\text{Mn}(\text{PO}_4)_2$)
 Iron lithium manganese phosphate ($\text{FeLi}_2\text{Mn}(\text{PO}_4)_2$)
 (redox cathode containing; synthesis of carbon-coated redox materials
 for use as battery cathodes and in electrochromic devices)
 REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 25 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:830853 HCAPLUS [Full-text](#)
 DOCUMENT NUMBER: 135:349452
 TITLE: Electric cells and gas sensors using alkali ion
 conductive glass ceramic
 INVENTOR(S): Fu, Jie
 PATENT ASSIGNEE(S): Kabushiki Kaisha Ohara, Japan
 SOURCE: U.S., 13 pp., Cont.-in-part of U.S. Ser. No.
 923,233, abandoned.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 3
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6315881	B1	20011113	US 1999-289242 <--	19990409
JP 09142874	A	19970603	JP 1995-320971 <--	19951115
JP 3126306	B2	20010122		
JP 10097811	A	19980414	JP 1997-38303 <--	19970206
JP 3012211	B2	20000221		
EP 857699	A2	19980812	EP 1997-110106 <--	19970620
EP 857699 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI	A3	19980916		
EP 1028094	A2	20000816	EP 2000-110476 <--	19970620
EP 1028094	A3	20000920		

EP 1028094	B1	20030521		
R: DE, FR, GB				
JP 2000026135	A	20000125	JP 1999-149686	19990528
			<--	
JP 4090148	B2	20080528		
PRIORITY APPLN. INFO.:			JP 1995-320971	A 19951115
			<--	
			JP 1996-115694	A 19960412
			<--	
			JP 1997-38303	A 19970206
			<--	
			US 1997-923233	B2 19970904
			<--	
			JP 1996-48379	A 19960209
			<--	
			EP 1997-110106	A3 19970620
			<--	

ED Entered STN: 15 Nov 2001

AB A solid elec. cell includes a case, a neg. electrode, a pos. electrode and a solid electrolyte. The neg. electrode, pos. electrode and solid electrolyte are disposed in the case in such a manner that the neg. electrode opposes the pos. electrode through the solid electrolyte. The solid electrolyte is made of an alkali ion conductive glass-ceramic having ion conductivity no less than 10⁻³ S/cm at room temperature. A gas sensor includes a case, a neg. electrode, a pos. electrode, a solid electrolyte and a layer for which an electromotive force corresponding to the concentration of the gas is produced between the two electrodes. In the case, the neg. electrode opposes the pos. electrode through the solid electrolyte. The solid electrolyte is made of an alkali ion conductive glass-ceramic having ion conductivity no less than 10⁻³ S/cm at room temperature.

IT 371788-57-7P

(elec. cells and gas sensors using alkali ion conductive glass ceramic)

RN 371788-57-7 HCPLUS

CN Aluminum gallium lithium titanium phosphate silicate
([Al,Ga,Li,Ti,(PO₄),(SiO₄)])0.4) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0 - 0.6	17181-37-2
O4P	2.4 - 3	14265-44-2
Ga	0 - 0.4	7440-55-3
Ti	1.6 - 2	7440-32-6
Li	1 - 2	7439-93-2
Al	0 - 0.4	7429-90-5

IC ICM G01N027-406

ICS C03C010-10; C03C004-18

INCL 204424000

CC 72-3 (Electrochemistry)

Section cross-reference(s): 57

IT 201010-48-2P 371788-57-7P

(elec. cells and gas sensors using alkali ion conductive glass ceramic)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

ACCESSION NUMBER: 2001:796402 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:346863
 TITLE: Cathode active material for nonaqueous electrolyte battery
 INVENTOR(S): Li, Guohua; Yamada, Atsuo
 PATENT ASSIGNEE(S): Sony Corporation, Japan
 SOURCE: Eur. Pat. Appl., 47 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1150367	A2	20011031	EP 2001-109945 <--	20010424
EP 1150367	A3	20070411		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, CY, TR, AL, MK				
JP 2001307731	A	20011102	JP 2000-128999 <--	20000425
JP 2001307732	A	20011102	JP 2000-129000 <--	20000425
CA 2344903	A1	20011025	CA 2001-2344903 <--	20010423
TW 525313	B	20030321	TW 2001-90109594 <--	20010423
MX 2001PA04028	A	20030820	MX 2001-PA4028 <--	20010423
CN 1322023	A	20011114	CN 2001-121243 <--	20010425
US 20010055718	A1	20011227	US 2001-842483 <--	20010425
US 6749967	B2	20040615		
KR 809854	B1	20080304	KR 2001-22364 <--	20010425
PRIORITY APPLN. INFO.:			JP 2000-128999 <--	A 20000425
			JP 2000-129000 <--	A 20000425

ED Entered STN: 02 Nov 2001

AB A pos. electrode active material and a nonaq. electrolyte cell which uses the pos. electrode active material are disclosed. The cell has a high discharge voltage without lowering the capacity and superior charging/discharging characteristics. To this end, the pos. electrode active material contains a compound represented by the general formula $LixMnyFe1-yPO4$, wherein $0 < x \leq 2$ and $0.5 < y < 0.95$, or a compound represented by the general formula $LixMnyAl-yPO4$, where $0 < x \leq 2$ and $0 < y < 1$ and wherein A is a metal element selected from among Ti, Zn, Mg and Co or plural metal elements selected from among Ti, Fe, Zn, Mg and Co.

IT 371145-93-6, Iron lithium manganese phosphate
(Fe0.05-0.5Li0-2Mn0.5-0.95(PO4))

(cathode active material for nonaq. electrolyte battery)

RN 371145-93-6 HCAPLUS

CN Iron lithium manganese phosphate (Fe0.05-0.5Li0-2Mn0.5-0.95(PO4)) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number

O4P		1		14265-44-2
Mn		0.5 - 0.95		7439-96-5
Li		0 - 2		7439-93-2
Fe		0.05 - 0.5		7439-89-6

IC ICM H01M004-50

ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 108-32-7, Propylene carbonate 616-38-6, Dimethylcarbonate 7429-90-5, Aluminum, uses 21324-40-3, Lithium hexafluorophosphate 371145-93-6, Iron lithium manganese phosphate (Fe0.05-0.5Li0.2Mn0.5-0.95(PO4)) (cathode active material for nonaq. electrolyte battery)

L25 ANSWER 27 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:688464 HCPLUS Full-text

DOCUMENT NUMBER: 135:347775

TITLE: Li3Sc2-xFex(PO4)3 thin films and powders prepared by ultrasonic spray pyrolysis

AUTHOR(S): Ivanov-Schitz, A. K.; Nistuk, A. V.; Demianets, L. N.; Chaban, N. G.

CORPORATE SOURCE: Institute of Crystallography, Russian Academy of Science, Moscow, Russia

SOURCE: Solid State Ionics (2001), 144(1,2), 133-141

CODEN: SSIOD3; ISSN: 0167-2738

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 20 Sep 2001

AB Thin films of Li3Sc2-xFex(PO4)3 ($x=0.5, 2$) solid electrolytes have been prepared on quartz glass substrates by ultrasonic spray pyrolysis (USP) using aqueous solns. of LiH2PO4, Sc(NO3)3 and Fe(NO3)3 at substrate temperature of 500-700°C. The amorphous as-deposited films were converted into crystalline materials by heat treatment at 800-1000°C. The optimal deposition parameters for formation of uniform precursor films with good adhesion to the substrate were determined. The dense films composed of fine columnar grains were obtained using the 3 cycles of deposition and annealing. The room temperature ionic conductivity of the film with the composition $x=0.5$ was $5+10^{-6}$ S/cm. The superionic γ-phase of USP ceramics of composition Li3Sc2-xFex(PO4)3 ($0 < x \leq 0.6$) was stabilized at room temperature, which may be caused by slight structural distortions and changes in the interactions between the lithium ions during $\text{Sc}^{3+} \rightarrow \text{Fe}^{3+}$ substitution. The highest ionic conductivity $\sigma(25^\circ\text{C}) \approx 1+10^{-5}$ S/cm was observed for ceramics with $x=0.4$.

IT 141051-47-0P, Iron lithium scandium phosphate

Fe0.2Li3Sc1.8(PO4)3 155694-16-9P, Iron lithium scandium phosphate Fe0.4Li3Sc1.6(PO4)3 155694-17-0P, Iron lithium scandium phosphate Fe0.6Li3Sc1.4(PO4)3 371758-79-1P, Iron lithium scandium phosphate (Fe0.1Li3Sc1.9(PO4)3) 371758-80-4P

, Iron lithium scandium phosphate (Fe0.3Li3Sc1.7(PO4)3) (powders and films; ultrasonic spray pyrolysis preparation and properties of Li3Sc2-xFex(PO4)3 thin films and powders)

RN 141051-47-0 HCPLUS

CN Iron lithium scandium phosphate (Fe0.2Li3Sc1.8(PO4)3) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number

10/551,935

O4P		3		14265-44-2
Sc		1.8		7440-20-2
Li		3		7439-93-2
Fe		0.2		7439-89-6

RN 155694-16-9 HCPLUS

CN Iron lithium scandium phosphate (Fe0.4Li3Sc1.6(PO4)3) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		3		14265-44-2
Sc		1.6		7440-20-2
Li		3		7439-93-2
Fe		0.4		7439-89-6

RN 155694-17-0 HCPLUS

CN Iron lithium scandium phosphate (Fe0.6Li3Sc1.4(PO4)3) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		3		14265-44-2
Sc		1.4		7440-20-2
Li		3		7439-93-2
Fe		0.6		7439-89-6

RN 371758-79-1 HCPLUS

CN Iron lithium scandium phosphate (Fe0.1Li3Sc1.9(PO4)3) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		3		14265-44-2
Sc		1.9		7440-20-2
Li		3		7439-93-2
Fe		0.1		7439-89-6

RN 371758-80-4 HCPLUS

CN Iron lithium scandium phosphate (Fe0.3Li3Sc1.7(PO4)3) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4P		3		14265-44-2
Sc		1.7		7440-20-2
Li		3		7439-93-2
Fe		0.3		7439-89-6

CC 57-2 (Ceramics)

Section cross-reference(s): 52, 76

IT 36058-25-0P, Iron lithium phosphate Fe2Li3(PO4)3 87796-15-4P,
Lithium scandium phosphate Li3Sc2(PO4)3 141051-47-0P, Iron
lithium scandium phosphate Fe0.2Li3Sc1.8(PO4)3 155694-16-9P,
Iron lithium scandium phosphate Fe0.4Li3Sc1.6(PO4)3
155694-17-0P, Iron lithium scandium phosphateFe0.6Li3Sc1.4(PO4)3 371758-79-1P, Iron lithium scandium
phosphate (Fe0.1Li3Sc1.9(PO4)3) 371758-80-4P, Iron lithium
scandium phosphate (Fe0.3Li3Sc1.7(PO4)3) 371758-81-5P

(powders and films; ultrasonic spray pyrolysis preparation and

properties of Li₃Sc_{2-x}Fe_x(PO₄)₃ thin films and powders)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 28 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:414793 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:35187
 TITLE: Batteries comprising solid electrolytes sandwiched in between spinel-type lithium manganate cathodes and spinel-type lithium titanate anodes
 INVENTOR(S): Hara, Toru; Kitahara, Nobuyuki; Uemura, Toshihiko; Mishima, Hiromitsu; Magome, Shinji; Osaki, Makoto; Higuchi, Hisashi
 PATENT ASSIGNEE(S): Kyocera Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001155763	A	20010608	JP 1999-336715	19991126 ---
PRIORITY APPLN. INFO.:			JP 1999-336715	19991126 ---

ED Entered STN: 08 Jun 2001
 AB The batteries comprise solid electrolytes of (A) sintered materials of Li₂MnO₃ and Li_{1+x+y}M_xTi_{2-x}Si_yP_{3-y}O₁₂ (I; M = Al or Ga; x = 0-0.4; 0 < y ≤ 0.6) on the cathode side and (B) sintered materials of Li₂TiO₃ and I on the anode side, sandwiched in between the electrodes and placed in an outer package. Such batteries with cathodes consisting of Li_{1+x}Mn_{2-x}O₄ (x = 0.05-0.2) or Li_{1+x}Ni_yMn_{2-x-y}O₄ (x = 0-0.2; 0.4 ≤ y < 0.6) and anodes consisting of Li_{1+x}Ti_{2-x}O₄ (x = 0.25-0.40) are also claimed. Batteries with low surface resistance between the electrodes and the electrolytes are obtained. The batteries are suitable for use in personal digital assistance.

IT 343950-39-0 343950-42-5
 (electrolyte; batteries comprising lithium titanium phosphate silicate electrolytes showing low surface resistances with lithium spinel oxide electrodes for use in personal digital assistances)

RN 343950-39-0 HCAPLUS
 CN Aluminum lithium titanium phosphate silicate (Al_{10-0.4}Li₁₋₂Ti_{1.4-2}(PO₄)_{2.4-3}(SiO₄)_{0-0.6}) (9CI) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
O ₄ Si		0 - 0.6		17181-37-2
O ₄ P		2.4 - 3		14265-44-2
Ti		1.4 - 2		7440-32-6
Li		1 - 2		7439-93-2
Al		0 - 0.4		7429-90-5

RN 343950-42-5 HCAPLUS
 CN Gallium lithium titanium phosphate silicate (Ga_{0-0.4}Li₁₋₂Ti_{1.4-2}(PO₄)_{2.4-3}(SiO₄)_{0-0.6}) (9CI) (CA INDEX NAME)

Component		Ratio		Component
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			Registry Number
O4Si	0 - 0.6		17181-37-2
O4P	2.4 - 3		14265-44-2
Ga	0 - 0.4		7440-55-3
Ti	1.4 - 2		7440-32-6
Li	1 - 2		7439-93-2

IC ICM H01M010-36
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)

Section cross-reference(s): 57

IT 343950-37-8 343950-39-0 343950-42-5
 (electrolyte; batteries comprising lithium titanium phosphate
 silicate electrolytes showing low surface resistances with lithium
 spinel oxide electrodes for use in personal digital assistances)

L25 ANSWER 29 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:351119 HCPLUS Full-text

DOCUMENT NUMBER: 135:124791

TITLE: Study on lithium fast ion conductors

Li_{1+2x+y}Al_xEu_yTi_{2-x-y}Si_xP_{3-x}O₁₂ systemAUTHOR(S): Fan, Rui-quan; Wang, Wen-ji; Lin, Shen
 CORPORATE SOURCE: Department of Chemistry, Fuzhou University,
 Fuzhou, Fujian, 350002, Peop. Rep. ChinaSOURCE: Fuzhou Daxue Xuebao, Ziran Kexueban (2001
), 29(1), 83-85

CODEN: FDXKEN; ISSN: 1000-2243

PUBLISHER: Fuzhou Daxue Xuebao Bianjibu

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

ED Entered STN: 17 May 2001

AB Natural layered aluminosilicate kaolinite Al₄[Si₄O₁₀](OH)₈ is used as a starting material for preparing a new system of lithium fast ion conductors Li_{1+2x+y}Al_xEu_yTi_{2-x-y}Si_xP_{3-x}O₁₂ by high temperature (800-1000°C) solid phase reaction for about 20 h. A solid solution phase with R.hivin.3C structure exists in a limited composition region. The elec. measurements indicate that the maximum conductivity in the above system (referred to as Al-Eu-Lisicon) is the initial composition with $\gamma = 0.2$ and $y = 0.1$ under which its conductivity reaches up to 9.98 m/cm at 400°C and the activation energy is 34.0 kJ/mol.

IT 350681-79-7
 (lithium fast ion conductors Li_{1+2x+y}Al_xEu_yTi_{2-x-y}Si_xP_{3-x}O₁₂ system)

RN 350681-79-7 HCPLUS

CN Aluminum europium lithium titanium phosphate silicate
 (Al_{0.1-0.8}Eu_{0.1-0.7}Li_{1.3-3.3}Ti_{0.5-1.8}(PO₄)_{2.2-2.9}(SiO₄)_{0.1-0.8}) (CA
 INDEX NAME)

Component		Ratio		Component
				Registry Number
O4Si	0.1 - 0.8		17181-37-2	
O4P	2.2 - 2.9		14265-44-2	
Eu	0.1 - 0.7		7440-53-1	
Ti	0.5 - 1.8		7440-32-6	
Li	1.3 - 3.3		7439-93-2	
Al	0.1 - 0.8		7429-90-5	

CC 52-2 (Electrochemical, Radiational, and Thermal Energy

Technology)

Section cross-reference(s): 72, 76

IT 350681-79-7 350681-81-1
 (lithium fast ion conductors $Li_1+2x+yAl_xEuyTi_{2-x-y}Si_xP_3-xO_{12}$
 system)

L25 ANSWER 30 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:192597 HCPLUS Full-text
 DOCUMENT NUMBER: 134:210598
 TITLE: Preparation of lithium-containing phosphates for
 battery use
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: U.S., 13 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6203946	B1	20010320	US 1998-204944 -->	19981203
US 20010021472	A1	20010913	US 2001-776843 -->	20010205
US 6720110	B2	20040413		
US 20040086784	A1	20040506	US 2003-681563 -->	20031006
PRIORITY APPLN. INFO.:			US 1996-717979 -->	A1 19960923
			WO 1997-US15544 -->	A1 19970904
			US 1998-204944 -->	A1 19981203
			US 2001-776843 -->	A1 20010205

ED Entered STN: 21 Mar 2001

AB The invention provides an electrochem. cell which comprises a first electrode and a second electrode which is a counter electrode to the first electrode. The first electrode comprises a phosphorous compound of the nominal general formula $Li_3E'aE''b(PO_4)_3$, desirably at least one E is a metal; and preferably, $Li_3M'M''(PO_4)_3$. E' and E'' are the same or different from one another. Where E' and E'' are the same, they are preferably metals having more than one oxidation state. Where E' and E'' are different from one another, they are preferably selected from the group of metals where at least one of E' and E'' has more than one oxidation state.

IT 329025-35-6P, Iron lithium phosphate ($Fe_2Li_1-3(PO_4)_3$)

(preparation of lithium-containing phosphates for battery use)

RN 329025-35-6 HCPLUS

CN Iron lithium phosphate ($Fe_2Li_1-3(PO_4)_3$) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
Li	1 - 3	7439-93-2
Fe	2	7439-89-6

IC ICM H01M004-58

ICS H01M004-48
 INCL 429231100
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT 36058-25-OP, Iron lithium phosphate Fe₂Li₃(PO₄)₃ 69104-85-4P,
 Chromium lithium phosphate Cr₂Li₃(PO₄)₃ 84159-18-2P, Lithium
 vanadium phosphate Li₃V₂(PO₄)₃ 285564-74-1P 329025-35-6F,
 Iron lithium phosphate (Fe₂Li_{1.3}(PO₄)₃) 329025-36-7P 329025-38-9P
 329025-39-0P
 (preparation of lithium-containing phosphates for battery use)
 REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 31 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2001:179635 HCPLUS Full-text
 DOCUMENT NUMBER: 134:210518
 TITLE: Process for large scale fabrication of lithium
 polymer batteries with solid electrolytes in the
 film technology
 INVENTOR(S): Meislitzer, Karl Heinz
 PATENT ASSIGNEE(S): Bangert, Wolfgang, Germany; Sebastian, Rudolf
 SOURCE: Ger. Offen., 12 pp.
 CODEN: GWXXBX
 DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19941861	A1	20010315	DE 1999-19941861	19990902 <--
PRIORITY APPLN. INFO.:			DE 1999-19941861	19990902 <--

ED Entered STN: 15 Mar 2001
 AB Films for cathodes and anodes as well as for the electrolytes are pulled from
 pastes of suitable composition and preparation. Cathode pastes are prepared
 from: 3-10% polymer or copolymer, PEO, polystyrene, polyvinyl chloride,
 polyvinylidene fluoride, or polyvinylidene fluoride-hexafluoropropylene
 copolymer (PVDF-HFP); 4-12% plasticizer (e.g., dibutylphthalate or dioctyl
 phthalate); 20-60 g% intercalation material (e.g., LiCoO₂, LiNiO₂, LiCo_xNi_{1-x}O₂, LiMn₂O₄ or VO_x); 2-10% elec. conductor (e.g., graphite powder or
 amorphous C); and 40-80% solvent (e.g., acetone). Anode paste comprises: 3-
 10% polymer or copolymer (e.g., PEO, polystyrene, PVC, PVDF, or PVDF-HFP
 copolymer), 4-12% plasticizer (di-Bu phthalate or dioctyl phthalate), 20-40%
 elec. conductor (graphite powder or amorphous C), and 40-80% solvent
 (acetone). The electrolyte paste comprises: 3-10 g% polymer or copolymer
 (PEO, polystyrene, PVC, PVDF or hexafluoropropylene-vinylidene fluoride
 copolymer), 4-12% plasticizer (DBP or DOP), 20-40% ionic conductor (Li₉Al₁Si_{0.8},
 Li_{1.3}Al_{10.3}Ti_{1.7}(PO₄)₃, Li₂O or Li₄SiO₄.Li₃PO₄), 2-10% ionic
 conductor (LiClO₄, LiBF₄, LiCl, LiBr, or LiI) and 40-80 g% solvent (acetone).
 IT 328899-26-9, Lithium titanium oxide phosphate (Li₃Ti₂O(PO₄)₃)
 (process for large scale fabrication of lithium polymer batteries
 with solid electrolytes in film technol.)
 RN 328899-26-9 HCPLUS
 CN Lithium titanium oxide phosphate (Li₃Ti₂O(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number

O		1		17778-80-2
O4P		3		14265-44-2
Ti		2		7440-32-6
Li		3		7439-93-2

IC ICM H01M004-04

ICS H01M004-62; H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide
 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide
 14283-07-9, Lithium tetrafluoroborate 30622-39-0, Lithium titanium
 phosphate Li₂(PO₄)₃ 120479-61-0, Aluminum lithium titanium
 phosphate Al_{0.3}Li_{1.3}Ti_{1.7}(PO₄)₃ 138728-82-2, Lithium phosphate
 silicate (Li_{3.5}(PO₄)_{0.5}(SiO₄)_{0.5}) 180728-17-0, Aluminum lithium
 oxide silicate (AlLi₉O₄(SiO₄)) 328899-26-9, Lithium titanium
 oxide phosphate (Li₃Ti₂O(PO₄)₃)
 (process for large scale fabrication of lithium polymer batteries
 with solid electrolytes in film technol.)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 32 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:83048 HCPLUS Full-text

DOCUMENT NUMBER: 1341:273893

TITLE: The synthesis and characterization of new lithium fast ion conductors Li_{1+2x+2y}Al_xZn_yTi_{2-x-y}Si₃P_{3-x}O₁₂ system

AUTHOR(S): Zhang, Yurong; Chen, Wenging; Wang, Wenji

CORPORATE SOURCE: Department of Chemistry, Fuzhou University,
 Fuzhou, 350002, Peop. Rep. China

SOURCE: Solid State Ionics: Materials and Devices,
 [Proceedings of the Asian Conference], 7th,
 Fuzhou, China, Oct. 29-Nov. 4, 2000 (2000***)
 , 69-73. Editor(s): Chowdari, B. V. K.; Wang,
 Wenji. World Scientific Publishing Co. Pte. Ltd.:
 Singapore, Singapore.

CODEN: 69AWLC

DOCUMENT TYPE: Conference

LANGUAGE: English

ED Entered STN: 05 Feb 2001

AB New lithium fast ion conductors Li_{1+2z+2y}Al_xZn_yTi_{2-x-y}Si₃P_{3-x}O₁₂ system based on Li₂Ti₂(PO₄)₃ were prep'd. by high temp.
 (900-1150°C) solid phase reaction for about 20 h using refined natural kaolinite as a starting material. The syntheses temps. decreased with increasing z and y for the above system. XRD anal. indicates that a Lisicon phase with the R3c space group can be found in the compn. range of z=0.1, yr≤0.7 and y=0.3, x≤0.3, while only when x=0.1, yr≤0.2 can a single Lisicon phase exist. A.C. impedance measurements showed that the best sample was characterized by the r ionic cond. of 1.61×10⁻³ S/cm at room temp. and 4.83×10⁻² S/cm at 673 K, its activation energy being 49.4 kJ/mol at the temp. range of 413-673 K.

IT ***332079-98-6P 332079-97-7P 332079-98-8P

332079-99-9P 332080-00-9P
 (synthesis and characterization of lithium fast ion conductor
 Li_{1+2x+2y}Al_xZn_yTi_{2-x-y}Si₃P_{3-x}O₁₂ system)

10/551,935

RN 332079-96-6 HCPLUS

CN Aluminum lithium titanium zinc phosphate silicate
(Al_{0.1}Li₂Ti_{1.5}Zn_{0.4}(PO₄)_{2.9}(SiO₄)_{0.1}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ Si	0.1	17181-37-2
O ₄ P	2.9	14265-44-2
Zn	0.4	7440-66-6
Ti	1.5	7440-32-6
Li	2	7439-93-2
Al	0.1	7429-90-5

RN 332079-97-7 HCPLUS

CN Aluminum lithium titanium zinc phosphate silicate
(Al_{0.1}Li_{2.2}Ti_{1.4}Zn_{0.5}(PO₄)_{2.9}(SiO₄)_{0.1}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ Si	0.1	17181-37-2
O ₄ P	2.9	14265-44-2
Zn	0.5	7440-66-6
Ti	1.4	7440-32-6
Li	2.2	7439-93-2
Al	0.1	7429-90-5

RN 332079-98-8 HCPLUS

CN Aluminum lithium titanium zinc phosphate silicate
(Al_{0.1}Li_{2.6}Ti_{1.22}Zn_{0.7}(PO₄)_{2.9}(SiO₄)_{0.1}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ Si	0.1	17181-37-2
O ₄ P	2.9	14265-44-2
Zn	0.7	7440-66-6
Ti	1.2	7440-32-6
Li	2.6	7439-93-2
Al	0.1	7429-90-5

RN 332079-99-9 HCPLUS

CN Aluminum lithium titanium zinc phosphate silicate
(Al_{0.2}Li₂Ti_{1.5}Zn_{0.3}(PO₄)_{2.8}(SiO₄)_{0.2}) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ Si	0.2	17181-37-2
O ₄ P	2.8	14265-44-2
Zn	0.3	7440-66-6
Ti	1.5	7440-32-6
Li	2	7439-93-2
Al	0.2	7429-90-5

RN 332080-00-9 HCPLUS

CN Aluminum lithium titanium zinc phosphate silicate
(Al_{0.3}Li_{2.2}Ti_{1.4}Zn_{0.3}(PO₄)_{2.7}(SiO₄)_{0.3}) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4Si	0.3		17181-37-2
O4P	2.7		14265-44-2
Zn	0.3		7440-66-6
Ti	1.4		7440-32-6
Li	2.2		7439-93-2
Al	0.3		7429-90-5

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 52

IT 332079-94-4P 332079-95-5P 332079-96-6P
332079-97-7P 332079-98-8P 332079-99-9P
332080-00-9P(synthesis and characterization of lithium fast ion conductor
Li_{1+2x+y}Al_xZn_yTi_{2-x-y}Si_xP_{3-x}O₁₂ system)REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 33 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:19967 HCPLUS Full-text

DOCUMENT NUMBER: 134:149942

TITLE: Enhancement of discharge capacity of Li₃V₂(PO₄)₃
by stabilizing the orthorhombic phase at room
temperatureAUTHOR(S): Sato, Mineo; Ohkawa, Hirokazu; Yoshida, Kenji;
Saito, Mai; Uematsu, Kazuyoshi; Toda, KenjiCORPORATE SOURCE: Department of Chemistry and Chemical Engineering,
Faculty of Engineering, Niigata University,
Niigata, 950-2181, JapanSOURCE: Solid State Ionics (2000), 135(1-4),
137-142PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 10 Jan 2001

AB Li₃V₂(PO₄)₃ and solid solns. of Li_{3-2x}(V_{1-x}Zrx)2(PO₄)₃ were prepared by a
solid state reaction. A high temperature orthorhombic phase of Li₃V₂(PO₄)₃
with a β -Fe₂(SO₄)₃-type was successfully stabilized at room temperature by
substituting Zr for V with substitution ratios beyond x=0.05. The pure
material of Li₃V₂(PO₄)₃ exhibited a cathode performance with two well defined
regions of plateau at around 3.7 and 4.1 V vs. Li/Li⁺ upon charging and 3.6
and 4.0 V vs. Li/Li⁺ upon discharging, resp., suggesting two types of phases
produced upon the charge/discharge process. On the other hand, the cathode
performance of the orthorhombic stabilized materials showed almost the same
charge/discharge voltages as those of the pure material, but, with two
plateaus slightly sloping, showed a considerably improved charge/discharge
cycle performance compared to that of the pure material. Such improvement on
the charge/discharge cycle performance is suggested to come from the
disordered lithium ion arrangement in the orthorhombic phase.IT 323204-07-5, Lithium vanadium zirconium phosphate
(Li₂.8V₁.8Zr₀.2(PO₄)₃) 323204-08-6, Lithium vanadium
zirconium phosphate (Li₂.6V₁.6Zr₀.4(PO₄)₃)(enhancement of discharge capacity of Li₃V₂(PO₄)₃ by stabilizing
the orthorhombic phase at room temperature)RN 323204-07-5 HCPLUS
CN Lithium vanadium zirconium phosphate (Li₂.8V₁.8Zr₀.2(PO₄)₃) (CA INDEX

NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.2	7440-67-7
V	1.8	7440-62-2
Li	2.8	7439-93-2

RN 323204-08-6 HCAPLUS

CN Lithium vanadium zirconium phosphate (Li_{2.6}V_{1.6}Zr_{0.4}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.4	7440-67-7
V	1.6	7440-62-2
Li	2.6	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)IT 84159-18-2, Lithium vanadium phosphate(Li₃V₂(PO₄)₃)
323204-07-5, Lithium vanadium zirconium phosphate
(Li_{2.6}V_{1.6}Zr_{0.2}(PO₄)₃) 323204-08-6, Lithium vanadium
zirconium phosphate (Li_{2.6}V_{1.6}Zr_{0.4}(PO₄)₃)
(enhancement of discharge capacity of Li₃V₂(PO₄)₃ by stabilizing
the orthorhombic phase at room temperature)REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 34 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:774123 HCAPLUS Full-text

DOCUMENT NUMBER: 133:352634

TITLE: Electrode materials having increased surface
conductivityINVENTOR(S): Ravet, Nathalie; Besner, Simon; Simoneau, Martin;
Vallee, Alain; Armand, Michel; Magnan,
Jean-francois

PATENT ASSIGNEE(S): Hydro-Quebec, Can.

SOURCE: Eur. Pat. Appl., 22 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1049182	A2	20001102	EP 2000-401207	20000502 <--
EP 1049182	A3	20040211		
EP 1049182	B1	20080102		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2270771	A1	20001030	CA 1999-2270771	19990430 <--

10/551,935

CA 2307119	A1	20001030	CA 2000-2307119 <--	20000428
CA 2625896	A1	20001030	CA 2000-2625896 <--	20000428
JP 2001015111	A	20010119	JP 2000-132779 <--	20000501
EP 1796189	A2	20070613	EP 2007-4289 <--	20000502
EP 1796189 R: DE, FR, GB, US 20020195591	A3 IT A1	20070620 20021226	US 2002-175794 <--	20020621
US 6855273	B2	20050215		
US 20040140458	A1	20040722	US 2003-740449 <--	20031222
US 6962666	B2	20051108		
US 20060060827	A1	20060323	US 2005-266339 <--	20051104
US 7344659	B2	20080318		
JP 2008186807	A	20080814	JP 2008-41303 <--	20080222
PRIORITY APPLN. INFO.:			CA 1999-2270771 <--	A 19990430
			CA 2000-2307119 <--	A3 20000428
			US 2000-560572 <--	B1 20000428
			JP 2000-132779 <--	A3 20000501
			EP 2000-401207 <--	A3 20000502
			US 2002-175794 <--	A3 20020621
			US 2003-740449 <--	A1 20031222

ED Entered STN: 05 Nov 2000

AB Intercalated electrode materials comprising complex oxides, especially Li oxides, are prepared, suitable for redox reaction by exchange of alkali metal ions (especially Li) and electrons with an electrolyte. The complex oxide electrodes can be used in batteries, supercapacitors or electrochromic light moderators. The complex oxides have the general formula AaMmZzOoNnFf, where A is alkali metal (e.g., Li), M is ≥1 transition metal (e.g., Fe, Mn, V, Ti, Mo, Nb, Zn, W), Z is ≥1 nonmetal (e.g., P, S, Si, Se, As, Ge, B, Sn), and a,m,z,o,n,f are chosen for elec. neutrality. A conductive carbon coating is formed or deposited on the surface of the electrode material, e.g., by pyrolysis of an organic material, hydrocarbons or polymers, for increased surface conductivity

IT 252943-50-3P, Lithium vanadium phosphate silicate

Li3.5V2(PO4)2.5(SiO4)0.5

(electrode materials having increased surface conductivity)

RN 252943-50-3 HCAPLUS

CN Lithium vanadium phosphate silicate (Li3.5V2(PO4)2.5(SiO4)0.5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
V	2	7440-62-2

Li | 3.5 | 7439-93-2

IC ICM H01M004-58
 ICS H01M004-48; H01M004-62
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 57, 72, 76
 IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiPO4) 30734-08-8P, Lithium manganese silicate Li₂MnSiO₄ 39302-37-9P, Lithium titanium oxide 180984-63-8P, Lithium magnesium titanium oxide 252943-50-3P, Lithium vanadium phosphate silicate Li₃.5V₂(PO₄)_{2.5}(SiO₄)_{0.5} 304905-30-4P 304905-31-5P, Iron lithium fluoride (FeLiO_{0.2}F₃) 304905-32-6P, Lithium manganese nitride oxide (Li₃MnNO) 304905-33-7P 304905-34-8P 304905-35-9P, Lithium magnesium titanium oxide (Li₃.5Mg_{0.5}Ti₄O₁₂) 304905-36-0P, Iron lithium phosphorus silicon oxide 304905-37-1P 304905-38-2P, Iron lithium phosphorus fluoride oxide 304905-39-3P 304905-40-6P 304905-41-7P 304905-42-8P

(electrode materials having increased surface conductivity)

L25 ANSWER 35 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:725896 HCAPLUS Full-text
 DOCUMENT NUMBER: 133:298811

TITLE: Method for manufacturing active material of positive plate for nonaqueous electrolyte secondary cell

INVENTOR(S): Li, Guohua; Yamada, Atsuo

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: PCT Int. Appl., 88 pp.
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000060679	A1	20001012	WO 2000-JP1915	20000328 ---
W: CA, CN, JP, KR, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CA 2334386	A1	20001012	CA 2000-2334386	20000328 ---
EP 1094532	A1	20010425	EP 2000-911428	20000328 ---
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
TW 494595	B	20020711	TW 2000-89106123	20000331 ---
PRIORITY APPLN. INFO.:				
			JP 1999-99407	A 19990406 ---
			JP 1999-274746	A 19990928 ---
			JP 1999-274747	A 19990928 ---
			WO 2000-JP1915	W 20000328 ---

ED Entered STN: 13 Oct 2000

AB A method for manufacturing an active material of a pos. plate which is doped/dedoped well reversely with/of lithium comprises mixing materials including a reducing agent to be used as a synthetic material of a compound whose composition is expressed by a general formula $LixMyPO_4$ (where $0 < x \leq 2$, $0.8 \leq y \leq 1.2$, and M is at least one element selected from 3d-transition metals) to produce a precursor and firing the precursor..

IT 213467-46-0P, Iron lithium manganese phosphate ($FeLi_2Mn(PO_4)_2$)
 (manufacture of active material of pos. plate for nonaq. electrolyte secondary cell)

RN 213467-46-0 HCPLUS

CN Iron lithium manganese phosphate ($FeLi_2Mn(PO_4)_2$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	2	14265-44-2
Mn	1	7439-96-5
Li	2	7439-93-2
Fe	1	7439-89-6

IC ICM H01M004-58
 ICS H01M010-40; H01M004-04
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 13826-59-0P, Lithium manganese phosphate 213467-46-0P, Iron lithium manganese phosphate ($FeLi_2Mn(PO_4)_2$)
 (manufacture of active material of pos. plate for nonaq. electrolyte secondary cell)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 36 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:688509 HCPLUS Full-text
 DOCUMENT NUMBER: 133:255027
 TITLE: Rechargeable lithium battery with lithium-containing phosphate active materials
 INVENTOR(S): Barker, Jeremy
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: PCT Int. Appl., 47 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000057505	A1	20000928	WO 2000-US4401	20000222
<--				
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6153333	A	20001128	US 1999-274371	19990323

CA 2367338	A1	20000928	CA 2000-2367338	20000222
			<--	
EP 1173897	A1	20020123	EP 2000-921341	20000222
			<--	
EP 1173897	B1	20080618		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, CY				
JP 2002540569	T	20021126	JP 2000-607293	20000222
			<--	
AU 764110	B2	20030807	AU 2000-41680	20000222
			<--	
US 6890686	B1	20050510	US 2001-936675	20000222
			<--	
AT 398840	T	20080715	AT 2000-921341	20000222
			<--	
MX 2001PA09565	A	20020311	MX 2001-PA9565	20010921
			<--	
IN 2001KN01067	A	20050708	IN 2001-KN1067	20011012
			<--	
PRIORITY APPLN. INFO.:			US 1999-274371	A1 19990323
			<--	
			WO 2000-US4401	W 20000222
			<--	

ED Entered STN: 29 Sep 2000

AB The invention provides novel lithium-containing phosphate materials having a high proportion of lithium per formula unit of the material. Upon electrochem. interaction, such material deintercalates lithium ions, and is capable of reversibly cycling lithium ions. The invention provides a rechargeable lithium battery which comprises an electrode formed from the novel lithium-containing phosphates.

IT 294664-30-5 294664-39-4 294664-56-5
294664-57-6 294664-59-8 294664-70-3
294664-72-5

(rechargeable lithium battery with lithium-containing phosphate active materials)

RN 294664-30-5 HCPLUS

CN Lithium vanadium phosphate phosphorofluoridate
(Li₂V₂(PO₄)₂.5(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
FO3P	0.5	15181-43-8
O4P	2.5	14265-44-2
V	2	7440-62-2
Li	2.5	7439-93-2

RN 294664-39-4 HCPLUS

CN Lithium vanadium phosphate phosphorofluoridate (Li₂V₂(PO₄)₂(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
FO3P	1	15181-43-8
O4P	2	14265-44-2
V	2	7440-62-2
Li	2	7439-93-2

RN 294664-56-5 HCAPLUS

CN Lithium manganese vanadium phosphate phosphorofluoridate
(Li_{2.5}MnV(PO₄)_{2.5}(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
FO3P	0.5	15181-43-8	
O4P	2.5	14265-44-2	
V	1	7440-62-2	
Mn	1	7439-96-5	
Li	2.5	7439-93-2	

RN 294664-57-6 HCAPLUS

CN Iron lithium vanadium phosphate phosphorofluoridate
(Fe_{1.5}Li₂V_{0.5}(PO₄)₂(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
FO3P	1	15181-43-8	
O4P	2	14265-44-2	
V	0.5	7440-62-2	
Li	2	7439-93-2	
Fe	1.5	7439-89-6	

RN 294664-59-8 HCAPLUS

CN Lithium vanadium phosphate phosphorofluoridate
(Li₃V₂(PO₄)_{2.5}(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
FO3P	0.5	15181-43-8	
O4P	2.5	14265-44-2	
V	2	7440-62-2	
Li	3	7439-93-2	

RN 294664-70-3 HCAPLUS

CN Lithium vanadium phosphate phosphorofluoridate (Li₃V₂(PO₄)₂(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
FO3P	1	15181-43-8	
O4P	2	14265-44-2	
V	2	7440-62-2	
Li	3	7439-93-2	

RN 294664-72-5 HCAPLUS

CN Lithium manganese vanadium phosphate phosphorofluoridate
(Li₃Mn_{0.5}V_{1.5}(PO₄)_{2.5}(PFO₃)_{0.5}) (9CI) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
FO3P	0.5	15181-43-8	
O4P	2.5	14265-44-2	
V	1.5	7440-62-2	

10/551,935

Mn		0.5		7439-96-5
Li		3		7439-93-2

IC ICM H01M004-58
 ICS H01M004-48; C01B025-30
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT 294664-30-5 294664-39-1 294664-56-5
 294664-57-6 294664-59-8 294664-70-3
 294664-72-5
 (rechargeable lithium battery with lithium-containing phosphate active
 materials)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 37 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:456288 HCAPLUS Full-text
 DOCUMENT NUMBER: 133:216938
 TITLE: CO₂ gas sensor using lithium ionic conductor with
 inside heater
 AUTHOR(S): Seo, M.-G.; Kang, B.-H.; Chai, Y.-S.; Song, K.-D.;
 Lee, D.-D.
 CORPORATE SOURCE: Department of Electronic Engineering, Kyungpook
 National University, Taegu, 702-701, S. Korea
 SOURCE: Sensors and Actuators, B: Chemical (2000
), B65(1-3), 346-348
 CODEN: SABCEB; ISSN: 0925-4005
 PUBLISHER: Elsevier Science S.A.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 07 Jul 2000
 AB The raw material for Li ionic conductor (Li_{1+x}Zr₂Si_xP_{3-x}O₁₂, where x is
 .apprx.2) was synthesized by sol-gel method. Eutectic mixture
 (Li₂CO₃:K₂CO₃:Na₂CO₃ = 47.0:25.6:27.4 weight %) was formed on the sensing
 electrode as an auxiliary material. For the wide range of CO₂ concentration
 from 1000 to 10,000 ppm, the electromotive force examined at 420° showed
 excellent agreement with theor. value of a Nernst's equation. The 90%
 response time was as short as 15-20 s. In 40-90% relative humidity, the
 electromotive force slope of sensor for CO₂ gas was 64-67 mV/decade. The
 long-term stability of the sensor was studied for 60 days.
 IT 81295-89-8D, Lithium zirconium phosphate silicate
 (Li₃Zr₂(PO₄)(SiO₄)₂), nonstoichiometric
 (CO₂ gas sensor using lithium ionic conductor with inside heater)
 RN 81295-89-8 HCAPLUS
 CN Lithium zirconium phosphate silicate (Li₃Zr₂(PO₄)(SiO₄)₂) (CA INDEX
 NAME)

Component		Ratio		Component
				Registry Number
O ₄ Si		2		17181-37-2
O ₄ P		1		14265-44-2
Zr		2		7440-67-7
Li		3		7439-93-2

CC 79-2 (Inorganic Analytical Chemistry)
 Section cross-reference(s): 72, 76
 IT 81295-89-8D, Lithium zirconium phosphate silicate
 (Li₃Zr₂(PO₄)(SiO₄)₂), nonstoichiometric

(CO₂ gas sensor using lithium ionic conductor with inside heater)
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 38 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 2000:368796 HCPLUS Full-text
 DOCUMENT NUMBER: 133:7071
 TITLE: Lithium based phosphates for use in lithium ion
 batteries and method of preparation
 INVENTOR(S): Barker, Jeremy; Saidi, M. Yazid
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA
 SOURCE: PCT Int. Appl., 69 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000031812	A1	20000602	WO 1999-US23074	19991005 <--
WO 2000031812	A9	20020822		
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JE, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6447951	B1	20020910	US 1998-195961	19981119 <--
CA 2351332	A1	20000602	CA 1999-2351332	19991005 <--
AU 9965076	A	20000613	AU 1999-65076	19991005 <--
AU 764529	B2	20030821		
EP 1135819	A1	20010926	EP 1999-953046	19991005 <--
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002530835	T	20020917	JP 2000-584544	19991005 <--
MX 2001PA04931	A	20040129	MX 2001-PA4931	20010516 <--
PRIORITY APPLN. INFO.:			US 1998-195961	A1 19981119 <--
			US 1996-717919	A2 19960923 <--
			WO 1999-US23074	W 19991005 <--

ED Entered STN: 04 Jun 2000

AB A Li ion battery comprises a first electrode having an active material in a first condition of the nominal general formula Li_{3-x}M'_yM''_{2-y}(PO₄)₃, x = 0, y = 0-2, and in a second condition of the nominal general formula Li_{3-x}M'_yM''_{2-y}(PO₄)₃, x = 0-3; M' is a transition metal and M'' is a nontransition metal selected from the group consisting of metals and metalloids; a second

electrode which is a counter electrode to the first electrode; and an electrolyte between the electrodes.

IT 204653-32-7, Aluminum lithiumvanadium phosphate AlLi₃V(PO₄)₃
(lithium based phosphates for use in lithium ion batteries and
method of preparation)

RN 204653-32-7 HCAPLUS

CN Aluminum lithium vanadium phosphate (AlLi₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Al	1	7429-90-5

IC ICM H01M004-58

ICS H01M010-40; C01B025-45

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate
7782-42-5, Graphite, uses 21324-40-3, Lithium hexafluorophosphate
84159-18-2, Lithium vanadium phosphate Li₃V₂(PO₄)₃ 204653-32-7
, Aluminum lithiumvanadium phosphate AlLi₃V(PO₄)₃ 270258-22-5
(lithium based phosphates for use in lithium ion batteries and
method of preparation)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 39 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:197818 HCAPLUS Full-text

DOCUMENT NUMBER: 132:224820

TITLE: Lithium vanadium phosphate composite compound and
its use as positive electrode for lithium ion
secondary battery

INVENTOR(S): Sato, Mineo; Toda, Kenji; Imanaka, Nobuto

PATENT ASSIGNEE(S): Osaka University, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000086215	A	20000328	JP 1998-261930 <--	19980916
JP 2949229	B2	19990913	JP 1998-261930	19980916
PRIORITY APPLN. INFO.:			<--	

ED Entered STN: 28 Mar 2000

AB Lithium vanadium phosphate composite compds. have the following formula
Li_y(V_{1-x}M_x)₂(PO₄)₃ where M is selected from aluminum, titanium and zirconium,
0<x≤0.2, and y is 3 when M is aluminum and or y is 3-2x when M is titanium or
zirconium. The composite compound which possesses excellent charge-discharge
behavior can be used as the pos. electrode for the lithium ion secondary
battery.

IT 261515-93-9, Aluminum lithium vanadium phosphate

(A10-0.2Li3V0.8-1(PO4)3) 261515-94-0, Lithium titanium vanadium phosphate (Li_{2.6}-3TiO_{0.2}V_{0.8}-1(PO₄)₃) 261515-95-1, Lithium vanadium zirconium phosphate (Li_{2.6}-3V0.8-1ZrO_{0.2}(PO₄)₃) (lithium vanadium phosphate composite compound and its use as pos. electrode for lithium ion secondary battery)

RN 261515-93-9 HCPLUS

CN Aluminum lithium vanadium phosphate (A10-0.2Li3V0.8-1(PO4)3) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	0.8 - 1	7440-62-2
Li	3	7439-93-2
Al	0 - 0.2	7429-90-5

RN 261515-94-0 HCPLUS

CN Lithium titanium vanadium phosphate (Li_{2.6}-3TiO_{0.2}V_{0.8}-1(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	0.8 - 1	7440-62-2
Ti	0 - 0.2	7440-32-6
Li	2.6 - 3	7439-93-2

RN 261515-95-1 HCPLUS

CN Lithium vanadium zirconium phosphate (Li_{2.6}-3V0.8-1ZrO_{0.2}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0 - 0.2	7440-67-7
V	0.8 - 1	7440-62-2
Li	2.6 - 3	7439-93-2

IC ICM C01B025-45

ICS H01M004-02; H01M004-58; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 261515-93-9, Aluminum lithium vanadium phosphate (A10-0.2Li3V0.8-1(PO4)3) 261515-94-0, Lithium titanium vanadium phosphate (Li_{2.6}-3TiO_{0.2}V_{0.8}-1(PO₄)₃) 261515-95-1, Lithium vanadium zirconium phosphate (Li_{2.6}-3V0.8-1ZrO_{0.2}(PO₄)₃) (lithium vanadium phosphate composite compound and its use as pos. electrode for lithium ion secondary battery)

L25 ANSWER 40 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:15552 HCPLUS Full-text

DOCUMENT NUMBER: 132:52431

TITLE: Method of preparation of lithium-containing silicophosphates for electrode active material of lithium batteries

INVENTOR(S): Barker, Jeremy

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 46 pp.
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000001024	A1	20000106	WO 1999-US11217	19990520 <--
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6136472	A	20001024	US 1998-105748	19980626 <--
CA 2333577	A1	20000106	CA 1999-2333577	19990520 <--
AU 9940918	A	20000117	AU 1999-40918	19990520 <--
EP 1090435	A1	20010411	EP 1999-924410	19990520 <--
EP 1090435	B1	20040804		
R: DE, ES, FR, GB, IT, IE				
JP 2002519836	T	20020702	JP 2000-557507	19990520 <--
EP 1282181	A2	20030205	EP 2002-25070	19990520 <--
EP 1282181	A3	20050330		
R: DE, ES, FR, GB, IT, IE				
HK 1036883	A1	20050429	HK 2001-105569	20010810 <--
PRIORITY APPLN. INFO.:			US 1998-105748	A1 19980626 <--
			EP 1999-924410	A3 19990520 <--
			WO 1999-US11217	W 19990520 <--

ED Entered STN: 07 Jan 2000
 AB The invention provides a new electrode active material and cells and batteries which utilize such active material. The active material is represented by the nominal general formula $LiaM'(2-b)M''bSiCp(3-c)O12$, $0 \leq b \leq 2$, $0 < c < 3$. M' and M'' are each elements selected from the group consisting of metal and metalloid elements. The value of the variable a depends upon the selection of M' and M'' and on the relative proportions designated as b and c .
 IT 252943-44-5, Lithium vanadium phosphate silicate
 $(Li3V2(PO4)2(SiO4))$ 252943-46-7 252943-47-8
 252943-48-9 252943-49-0 252943-50-3,
 Lithium vanadium phosphate silicate ($Li3.5V2(PO4)2.5(SiO4)0.5$)
 252943-51-4

(method of preparation of lithium-containing silicophosphates for electrode active material of lithium batteries)

RN 252943-44-5 HCPLUS

CN Lithium vanadium phosphate silicate ($Li3V2(PO4)2(SiO4)$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	1	17181-37-2
O4P	2	14265-44-2
V	2	7440-62-2
Li	3	7439-93-2

RN 252943-46-7 HCPLUS
CN Lithium manganese vanadium phosphate silicate ($\text{Li}_3\text{MnV}(\text{PO}_4)_2(\text{SiO}_4)$)
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	1	17181-37-2
O4P	2	14265-44-2
V	1	7440-62-2
Mn	1	7439-96-5
Li	3	7439-93-2

RN 252943-47-8 HCPLUS
CN Lithium titanium vanadium phosphate silicate ($\text{Li}_3\text{TiV}(\text{PO}_4)_2(\text{SiO}_4)$) (CA
INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	1	17181-37-2
O4P	2	14265-44-2
V	1	7440-62-2
Ti	1	7440-32-6
Li	3	7439-93-2

RN 252943-48-9 HCPLUS
CN Chromium lithium titanium phosphate silicate ($\text{CrLi}_3\text{Ti}(\text{PO}_4)_2(\text{SiO}_4)$)
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	1	17181-37-2
O4P	2	14265-44-2
Cr	1	7440-47-3
Ti	1	7440-32-6
Li	3	7439-93-2

RN 252943-49-0 HCPLUS
CN Aluminum lithium vanadium phosphate silicate
($\text{AlLi}_3.5\text{V}(\text{PO}_4)_2.5(\text{SiO}_4)0.5$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
V	1	7440-62-2
Li	3.5	7439-93-2
Al	1	7429-90-5

RN 252943-50-3 HCAPLUS
 CN Lithium vanadium phosphate silicate ($\text{Li}_{3.5}\text{V}_2(\text{PO}_4)_{2.5}(\text{SiO}_4)_{0.5}$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
V	2	7440-62-2
Li	3.5	7439-93-2

RN 252943-51-4 HCAPLUS
 CN Aluminum chromium lithium phosphate silicate
 $(\text{AlCrLi}_{3.5}(\text{PO}_4)_{2.5}(\text{SiO}_4)_{0.5})$ (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
Cr	1	7440-47-3
Li	3.5	7439-93-2
Al	1	7429-90-5

IC ICM H01M004-58
 ICS H01M010-40; C01B025-45

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 252943-44-5, Lithium vanadium phosphate silicate
 $(\text{Li}_3\text{V}_2(\text{PO}_4)_2(\text{SiO}_4))$ 252943-46-7 252943-47-8
 252943-48-9 252943-49-0 252943-50-3,
 Lithium vanadium phosphate silicate ($\text{Li}_{3.5}\text{V}_2(\text{PO}_4)_{2.5}(\text{SiO}_4)_{0.5}$)
 252943-51-4

(method of preparation of lithium-containing silicophosphates for electrode active material of lithium batteries)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 41 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:661912 HCAPLUS Full-text

DOCUMENT NUMBER: 131:324968

TITLE: Improvement of discharge capacity of
 $\beta\text{-Fe}_2(\text{SO}_4)_3$ -type $\text{Li}_3\text{V}_2(\text{PO}_4)_3$ by stabilizing
 high temperature orthorhombic phase at room
 temperature

AUTHOR(S): Ohkawa, Hirokazu; Yoshida, Kenji; Saito, Mai;
 Uematsu, Kazuyoshi; Toda, Kenji; Sato, Mineo

CORPORATE SOURCE: Department of Chemistry and Chemical Engineering,
 Faculty of Engineering, Niigata University,
 Niigata, 950-2181, Japan

SOURCE: Chemistry Letters (1999), (10),
 1017-1018

PUBLISHER: CODEN: CMILTAG; ISSN: 0366-7022

DOCUMENT TYPE: Chemical Society of Japan

LANGUAGE: Journal

ED Entered STN: 18 Oct 1999 English

AB The cathode performance of a lithium ion battery was investigated for β -Fe₂(SO₄)₃-type Li₃V₂(PO₄)₃ and Li₃(V_{1-x}Zr_x)₂(PO₄)₃ ($x=0.05, 0.1, 0.15, 0.2$). On TG-DTA measurements, Li₃V₂(PO₄)₃ exhibited two types of phase transition, while Li₃(V_{1-x}Zr_x)₂(PO₄)₃ exhibited no phase transition. Powder X-ray diffraction anal. and conductivity measurements confirmed an evidence for the stabilization of the high temperature phase at room temperature. The discharge capacity of the Zr-substituted Li₃(V_{1-x}Zr_x)₂(PO₄)₃ samples became much larger than that of the pure Li₃V₂(PO₄)₃ sample.

IT 248263-63-0, Lithium vanadium zirconium phosphate (Li₃V_{1.9}Zr_{0.1}(PO₄)₃) 248263-64-1, Lithium vanadium zirconium phosphate (Li₃V_{1.8}Zr_{0.2}(PO₄)₃) 248263-65-2, Lithium vanadium zirconium phosphate (Li₃V_{1.7}Zr_{0.3}(PO₄)₃) 248263-66-3, Lithium vanadium zirconium phosphate (Li₃V_{1.6}Zr_{0.4}(PO₄)₃) (improvement of discharge capacity of β -Fe₂(SO₄)₃-type Li₃V₂(PO₄)₃ by stabilizing high temperature orthorhombic phase at room temperature)

RN 248263-63-0 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₃V_{1.9}Zr_{0.1}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.1	7440-67-7
V	1.9	7440-62-2
Li	3	7439-93-2

RN 248263-64-1 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₃V_{1.8}Zr_{0.2}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.2	7440-67-7
V	1.8	7440-62-2
Li	3	7439-93-2

RN 248263-65-2 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₃V_{1.7}Zr_{0.3}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Zr	0.3	7440-67-7
V	1.7	7440-62-2
Li	3	7439-93-2

RN 248263-66-3 HCPLUS

CN Lithium vanadium zirconium phosphate (Li₃V_{1.6}Zr_{0.4}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2

Zr		0.4		7440-67-7
V		1.6		7440-62-2
Li		3		7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 84159-18-2, Lithium vanadium phosphate Li₃V₂(PO₄)₃ 248263-63-0
, Lithium vanadium zirconium phosphate (Li₃V_{1.9}Zr_{0.1}(PO₄)₃)
248263-64-1, Lithium vanadium zirconium phosphate
(Li₃V_{1.8}Zr_{0.2}(PO₄)₃) 248263-65-2, Lithium vanadium zirconium
phosphate (Li₃V_{1.7}Zr_{0.3}(PO₄)₃) 248263-66-3, Lithium vanadium
zirconium phosphate (Li₃V_{1.6}Zr_{0.4}(PO₄)₃)
(improvement of discharge capacity of β -Fe₂(SO₄)₃-type
Li₃V₂(PO₄)₃ by stabilizing high temperature orthorhombic phase at room
temperature)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 42 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:329765 HCAPLUS [Full-text](#)
DOCUMENT NUMBER: 131:62048

TITLE: Effect of the ion substitution on the ionic conductivity of solid electrolytes based on lithium titanium phosphate

AUTHOR(S): Kang, Eun-Tae; Wee, Hong-Bok; Kwon, Young-Jean

CORPORATE SOURCE: Department of Inorganic Materials Engineering,
Gyeongsang National University, Gyeongnam,
660-701, S. Korea

SOURCE: Yoog Hakhoechi (1999), 36(4), 380-390

CODEN: YPHJAP; ISSN: 0372-7807

PUBLISHER: Korean Ceramic Society

DOCUMENT TYPE: Journal

LANGUAGE: Korean

ED Entered STN: 28 May 1999

AB L_{1+x}Ti₂Si_xP_{3-x}O₁₂, L_{1+x}Ti₂Al_xP_{3-x}O₁₂, and L_{1+x}Ti_{2-x}Al_x(PO₄)₃ (0≤x≤0.5) were synthesized, and the structure, the d. and the ionic conductivity of samples were investigated. The main structure was a LiTi₂(PO₄)₃ (S.G: R-3CH) phase over all systems, except for L_{1+x}Ti₂Al_xP_{3-x}O₁₂ system in the range of x≥0.4 which had LiTi₂O₅ (S.G: Pnma) as a main phase. The d. and the conductivity of samples increased with increasing x, but decreased by the precipitation of the second phase. Consequently the ionic conductivity of these system could be increased by increasing the d. and decreased by precipitating the second phases. The highest ionic conductivity of 1.29 + 10-3 Scm-1 at 25°C was obtained in L_{1.3}Ti₂Si_{0.3}P₂.7O₁₂.

IT 228266-12-4

(solid electrolytes; effects of Al and Si ion substitution on the ionic conductivity of lithium titanium phosphate solid electrolytes)

RN 228266-12-4 HCAPLUS

CN Aluminum lithium titanium oxide phosphate (Al_{0.5}Li₂Ti₂O₂(PO₄)_{2.5}) (CA INDEX NAME)

Component		Ratio		Component
				Registry Number
<hr/>				
O		2		17778-80-2
O4P		2.5		14265-44-2
Ti		2		7440-32-6
Li		2		7439-93-2

Al | 0.5 | 7429-90-5

CC 57-2 (Ceramics)

Section cross-reference(s): 52

IT 30622-39-0, Lithium titanium phosphate LiTi₂(PO₄)₃ 120479-61-0,Aluminum lithium titanium phosphate Al_{0.3}Li_{1.3}Ti_{1.7}(PO₄)₃

127660-09-7, Lithium titanium phosphate silicate

(Li_{1.4}Ti₂(PO₄)_{2.6}(SiO₄)_{0.4}) 127660-10-0, Lithium phosphorus silicontitanium oxide Li_{1.3}P_{2.7}Si_{0.3}Ti₂O₁₂ 127660-11-1, Lithium titaniumphosphate silicate (Li_{1.2}Ti₂(PO₄)_{2.8}(SiO₄)_{0.2}) 127672-84-8, Lithiumtitanium phosphate silicate (Li_{1.5}Ti₂(PO₄)_{2.5}(SiO₄)_{0.5}) 131266-83-6,Aluminum lithium titanium phosphate Al_{0.5}Li_{1.5}Ti_{1.5}(PO₄)₃138198-90-0, Lithium titanium oxide phosphate LiTiO(PO₄)159157-31-0, Aluminum lithium titanium phosphate Al_{0.4}Li_{1.4}Ti_{1.6}(PO₄)₃163119-08-2, Aluminum lithium titanium phosphate Al_{0.2}Li_{1.2}Ti_{1.8}(PO₄)₃214119-31-0, Aluminum lithium titanium phosphate Al_{0.1}Li_{1.1}Ti_{1.9}(PO₄)₃

228266-07-7, Lithium titanium phosphate silicate

(Li_{1.1}Ti₂(PO₄)_{2.9}(SiO₄)_{0.1}) 228266-08-8 228266-09-9 228266-10-2

228266-11-3 228266-12-4

(solid electrolytes; effects of Al and Si ion substitution on the
ionic conductivity of lithium titanium phosphate solid electrolytes)REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

L25 ANSWER 43 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:509379 HCPLUS Full-text

DOCUMENT NUMBER: 129:191547

ORIGINAL REFERENCE NO.: 129:38873a,38876a

TITLE: Nonaqueous-electrolyte lithium secondary battery
having high discharge capacity

INVENTOR(S): Nagata, Mikito; Karril, Amin; Tsukamoto, Kotobuki

PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10208730	A	19980807	JP 1997-25985	19970124
PRIORITY APPLN. INFO.:			JP 1997-25985	19970124

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ED Entered STN: 17 Aug 1998

AB In the title battery, cathode contains a Li-containing metal oxide as an active mass and another substance having Li⁺-discharging potential higher than that of the metal oxide and of amount corresponding to an amount of Li⁺ consumed in the initial charging. Preferably, the substance is selected from Li_{1+x}Mn₂O₄ (X = 0-1), Li₂NiO₂, LiMnO₂, Li₂Mn_{2-x}M_xO₄ (M = Co, Ni, Zn, Mg, Fe; X = 0-2), Li₂Mn_{1.5}Ni_{0.5}O₄, Li_xVO₃ (X = 1-6), Li₃Fe₂(PO₄)₃, Li₃Fe₂(SO₄)₃, Li₃FeV(PO₄)₃, and Li₃V(PO₄)₃. Anode in the battery may be selected from graphite, coke, (amorphous) carbon, SnO, SnO₂, Sn_{1-x}M_xO (M = Hg, P, B, Si, Ge Sb; 0 ≤ X < 1), Sn_{1-x}M_xO₂ (M = Hg, P, B, Si, Ge, Sb; 0 ≤ X < 1), Sn₃₀₂(OH)₂, Sn_{3-x}M_xO₂(OH)₂ (M = Mg, P, B, Si, Ge, Sb, As, Mn; 0 ≤ X < 3), Li₂SiO₂, SiO₂, and Li₂SnO₂. Lack of Li⁺ consumed in formation of a surficial film on the anode and Li⁺ trapped in the anode both occurring in the initial charging is supplemented by the substance.

IT 186131-68-0, Iron lithium vanadium phosphate (FeLi3V(PO₄)₃)
 211753-59-2, Lithium vanadium phosphate (Li₃V(PO₄)₃)
 (lithium ion supplier in cathode; Li secondary batteries with
 cathodes containing Li metal oxide and Li⁺ supplier additives)
 RN 186131-68-0 HCAPLUS
 CN Iron lithium vanadium phosphate (FeLi3V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Fe	1	7439-89-6

RN 211753-59-2 HCAPLUS
 CN Lithium vanadium phosphate (Li₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2

IC ICM H01M004-02
 ICS H01M004-58; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-79-7, Lithium
 manganese oxide (LiMnO₂) 12325-84-7, Lithium nickel oxide (Li₂NiO₂)
 36058-25-0, Lithium iron phosphate [Li₃Fe₂(PO₄)₃] 123550-86-7,
 Lithium manganese oxide (Li_{0.5}-MnO₂) 186131-68-0, Iron
 lithium vanadium phosphate (FeLi₃V(PO₄)₃) 200938-46-1, Lithium
 manganese nickel oxide (Li₂Mn_{1.5}Ni_{0.5}O₄) 211753-57-0, Lithium
 vanadium oxide (Li₁-6VO₃) 211753-58-1, Iron lithium sulfate
 (Fe₂Li₃(SO₄)₃) 211753-59-2, Lithium vanadium phosphate
 (Li₃V(PO₄)₃)
 (lithium ion supplier in cathode; Li secondary batteries with
 cathodes containing Li metal oxide and Li⁺ supplier additives)

L25 ANSWER 44 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1998:404670 HCAPLUS Full-text
 DOCUMENT NUMBER: 129:97673
 ORIGINAL REFERENCE NO.: 129:20091a,20094a
 TITLE: Characteristics of 3D framework cathodes with
 (XO₄)_n- polyanions
 AUTHOR(S): Okada, S.; Arai, H.; Asakura, K.; Sakurai, Y.;
 Yamaki, J.; Nanjundaswamy, K. S.; Padhi, A. K.;
 Masquelier, C.; Goodenough, J. B.
 CORPORATE SOURCE: NTT Integrated Information and Energy Systems
 Laboratories, Ibaraki, 319-11, Japan
 SOURCE: Progress in Batteries & Battery Materials (1997), 16, 302-308
 CODEN: PBBMEF; ISSN: 1099-4467
 PUBLISHER: ITE-JEC Press Inc.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 02 Jul 1998

AB In an effort to identify alternate NASICON related framework hosts for Li intercalation, we have investigated the synthesis and electrochem. characterization of 3 inexpensive, environmentally benign phosphates containing Fe and V, viz. Li₃Fe₂(PO₄)₃, Li₃V₂(PO₄)₃, and Li₃FeV(PO₄)₃. The compds. are synthesized by a one-step solid state reaction. The redox voltages V⁴⁺/V³⁺ and Fe³⁺/Fe²⁺ in these compds. are tech. attractive for Li rechargeable battery applications. Moreover, the octahedral-site redox couples V⁴⁺/V³⁺ and V³⁺/V²⁺ are separated by 2.0 V, and both the Fe³⁺/Fe²⁺ and V³⁺/V²⁺ redox voltages get reduced by 0.8 V on going from the sulfate to the phosphate polyanion.

IT 186131-68-0, Iron lithium vanadiumphosphate FeLi₃V(PO₄)₃

(characteristics of 3D framework cathodes with (XO₄)_n- polyanions)

RN 186131-68-0 HCAPLUS

CN Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Fe	1	7439-89-6

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 36058-25-0, Iron lithium phosphate Fe₂Li₃(PO₄)₃ 84159-18-2, Lithium vanadium phosphate Li₃V₂(PO₄)₃ 186131-68-0, Iron lithium vanadiumphosphate FeLi₃V(PO₄)₃

(characteristics of 3D framework cathodes with (XO₄)_n- polyanions)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 45 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:221666 HCAPLUS Full-text

DOCUMENT NUMBER: 129:20826

ORIGINAL REFERENCE NO.: 129:4335a,4338a

TITLE: New cathode materials for rechargeable lithium batteries: the 3-D framework structures Li₃Fe₂(XO₄)₃ (X = P, As)

AUTHOR(S): Masquelier, C.; Padhi, A. K.; Nanjundaswamy, K. S.; Goodenough, J. B.

CORPORATE SOURCE: Center for Materials Science and Engineering, University of Texas at Austin, Austin, TX, 78712-1063, USA

SOURCE: Journal of Solid State Chemistry (1998), 135(2), 228-234

CODEN: JSSCB1; ISSN: 0022-4596

PUBLISHER: Academic Press

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 22 Apr 1998

AB Electrochem. insertion of lithium into four Li₃Fe₂(XO₄)₃ polymorphs (X = P or As) with 3-D framework structures was carried out in "Li/LiClO₄ (PC:DME)cathode" coin cells. Approx. 2 Li per formula unit could be reversibly inserted into the three different structures, which corresponds to the reduction of all Fe³⁺ to Fe²⁺ between 2.5 and 3.5 V vs lithium. The position of the Fe³⁺/Fe²⁺ redox couple below the lithium-anode Fermi energy is nearly independent of the structure and of whether X = P or As. There is, however, a clear dependence of (i) the shape of the Vcc vs x curves for

$\text{Li}_{3+x}\text{Fe}_2(\text{XO}_4)_3$ and (ii) the charge-discharge rate capabilities on the crystal structure of the cathode material.

IT 198782-41-1, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{3-5}(\text{PO}_4)_3$)
 (new cathode materials for rechargeable lithium batteries: 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ (X = P, As))
 RN 198782-41-1 HCAPLUS
 CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_{3-5}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Li	3 - 5	7439-93-2
Fe	2	7439-89-6

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 56

IT 198782-41-1, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{3-5}(\text{PO}_4)_3$)
 (new cathode materials for rechargeable lithium batteries: 3-D framework structures $\text{Li}_3\text{Fe}_2(\text{XO}_4)_3$ (X = P, As))

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 46 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:197714 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 128:232794

ORIGINAL REFERENCE NO.: 128:46045a, 46048a

TITLE: Lithium-containing, lithium-intercalating phosphates and their use as electrode material in secondary lithium-ion battery

INVENTOR(S): Barker, Jeremy; Saidi, Mohamed-Yazid

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 42 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9812761	A1	19980326	WO 1997-US15544	19970904
			<--	
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BE, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5871866	A	19990216	US 1996-717979	19960923
			<--	
CA 2266365	A1	19980326	CA 1997-2266365	19970904
			<--	
AU 9744102	A	19980414	AU 1997-44102	19970904
			<--	
EP 931361	A1	19990728	EP 1997-942393	19970904
			<--	

EP 931361	B1	20011205		
R: DE, ES, FR, GB, IT, IE				
JP 2001500665	T	20010116	JP 1998-514693	19970904
			<--	
EP 1093174	A1	20010418	EP 2001-200220	19970904
			<--	
EP 1093174	B1	20031217		
R: DE, ES, FR, GB, IT, IE				
ES 2169425	T3	20020701	ES 1997-942393	19970904
			<--	
EP 1403945	A1	20040331	EP 2003-25462	19970904
			<--	
EP 1403945	B1	20060301		
R: DE, ES, FR, GB, IT, IE				
ES 2258196	T3	20060816	ES 2003-25462	19970904
			<--	
KR 2000036230	A	20000626	KR 1999-702302	19990318
			<--	
HK 1023850	A1	20020823	HK 2000-100559	20000128
			<--	
US 20010021472	A1	20010913	US 2001-776843	20010205
			<--	
US 6720110	B2	20040413		
PRIORITY APPLN. INFO.:			US 1996-717979	A1 19960923
			<--	
			EP 1997-942393	A3 19970904
			<--	
			WO 1997-US15544	W 19970904
			<--	
			US 1998-204944	A1 19981203
			<--	
			EP 2001-200220	A3 20010123
			<--	

ED Entered STN: 06 Apr 1998

AB The phosphates comprise Li(3-x)MM'(PO4)3, where in the 1st condition x = 0, at least 1 of M and M' is a metal, and M and M' are the same or different from one another; and in the 2nd condition 0 < x ≤ 3 and at least 1 of M and M' has an oxidation state higher than its oxidation state in the 1st condition P compound One of M and M' is selected from Mg, Ca, Cu, Co, Fe, Ni, Mo, V, Cr, Mn, and Ti. The phosphates comprise Li3V2(PO4)3, Li3VTi(PO4)3, Li3Fe2(PO4)3, and Li3FeV(PO4)3.

IT 186131-68-0, Iron lithium vanadium phosphate (FeLi3V(PO4)3)
 204653-31-6, Lithium titanium vanadium phosphate
 (Li3TiV(PO4)3) 204653-32-7, Aluminum lithium vanadium
 phosphate (AlLi3V(PO4)3) 204653-33-8, Chromium lithium
 potassium phosphate (CrLi3K(PO4)3) 204653-34-9, Lithium
 molybdenum potassium phosphate (Li3MoK(PO4)3)
 (electrode material for secondary lithium-ion battery)

RN 186131-68-0 HCAPLUS

CN Iron lithium vanadium phosphate (FeLi3V(PO4)3) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Fe	1	7439-89-6

RN 204653-31-6 HCAPLUS

CN Lithium titanium vanadium phosphate (Li₃TiV(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Ti	1	7440-32-6
Li	3	7439-93-2

RN 204653-32-7 HCPLUS

CN Aluminum lithium vanadium phosphate (AlLi₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Al	1	7429-90-5

RN 204653-33-8 HCPLUS

CN Chromium lithium potassium phosphate (CrLi₃K(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Cr	1	7440-47-3
K	1	7440-09-7
Li	3	7439-93-2

RN 204653-34-9 HCPLUS

CN Lithium molybdenum potassium phosphate (Li₃MoK(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
K	1	7440-09-7
Mo	1	7439-98-7
Li	3	7439-93-2

IC ICM H01M004-58

ICS H01M004-52; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy
Technology)IT 36058-25-0, Iron lithium phosphate (Fe₂Li₃(PO₄)₃) 186131-68-0
, Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃) 204653-31-6, Lithium titanium vanadium phosphate (Li₃TiV(PO₄)₃)

204653-32-7, Aluminum lithium vanadium phosphate

(AlLi₃V(PO₄)₃) 204653-33-8, Chromium lithium potassiumphosphate (CrLi₃K(PO₄)₃) 204653-34-9, Lithium molybdenumpotassium phosphate (Li₃MoK(PO₄)₃)

(electrode material for secondary lithium-ion battery)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN THE
RE FORMAT

ACCESSION NUMBER: 1998:32205 HCPLUS Full-text
 DOCUMENT NUMBER: 128:90963
 ORIGINAL REFERENCE NO.: 128:17737a,17740a
 TITLE: Stabilization of superionic conduction phase in Li₃Sc₂(PO₄)₃
 AUTHOR(S): Suzuki, Takahito; Yoshida, Kenji; Uematsu, Kazuyoshi; Kodama, Tatsuya; Toda, Kenji; Ye, Zuo-Guang; Sato, Mineo
 CORPORATE SOURCE: Department of Active Material Chemistry, Niigata University, Niigata, 950-21, Japan
 SOURCE: Solid State Ionics (1997), 104(1,2), 27-33
 CODEN: SSIOD3; ISSN: 0167-2738
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 21 Jan 1998
 AB Lithium superion conductors, Li_{3+2x}(Sc_{1-x}Mg_x)₂(PO₄)₃, Li_{3-2x}(Sc_{1-x}M_x)₂(PO₄)₃ (M = Ti, Zr, Sn, Hf) and Li_{3-4x}(Sc_{1-x}M_x)₂(PO₄)₃ (M = Nb, Ta) were prepared by a solid-state reaction. TG-DTA anal. indicated no phase transition in Li_{3+2x}(Sc_{1-x}Mg_x)₂(PO₄)₃ and Li_{3-2x}(Sc_{1-x}M_x)₂(PO₄)₃ (M = Ti, Zr, Sn, Hf) with x higher than 0.05, and in Li_{3-4x}(Sc_{1-x}M_x)₂(PO₄)₃ (M = Nb, Ta) with x higher than 0.25. The room temperature ionic conductivity of Li₃Sc₂(PO₄)₃ has been increased by three orders of magnitude with the highest conductivity observed in Li_{3-2x}(Sc_{1-x}Ti_x)₂(PO₄)₃ with x = 0.20 and in Li_{3-2x}(Sc_{1-x}Zr_x)₂(PO₄)₃ with x = 0.10. It was ascribed to the stabilization of the high temperature superionic conduction phase and the introduction of vacancies on the Li⁺ sites by substituting Ti⁴⁺ or Zr⁴⁺ for Sc³⁺.
 IT 190652-55-2, Lithium scandium zirconium phosphate
 Li_{2.8}Sc_{1.8}Zr_{0.2}(PO₄)₃ 201036-54-6, Lithium scandium titanium phosphate (Li_{2.95}Sc_{1.95}Ti_{0.05}(PO₄)₃) 201036-55-7, Lithium scandium titanium phosphate (Li_{2.95}Sc_{1.95}Ti_{0.1}(PO₄)₃) 201036-56-8, Lithium scandium titanium phosphate (Li_{2.8}Sc_{1.8}Ti_{0.2}(PO₄)₃) 201036-57-9, Lithium scandium titanium phosphate (Li_{2.6}Sc_{1.6}Ti_{0.4}(PO₄)₃) 201036-58-0, Lithium scandium titanium phosphate (Li_{2.4}Sc_{1.4}Ti_{0.6}(PO₄)₃) 201036-59-1, Lithium niobium scandium phosphate (Li_{2.9}Nb_{0.02}Sc_{1.98}(PO₄)₃) 201036-64-9, Lithium niobium scandium phosphate (Li_{2.9}Nb_{0.05}Sc_{1.95}(PO₄)₃) 201036-67-1, Lithium scandium titanium phosphate (Li_{2.4}Sc_{1.6}Ti_{0.4}(PO₄)₃) 201036-68-2, Lithium niobium scandium phosphate (Li_{2.8}Nb_{0.1}Sc_{1.9}(PO₄)₃) 201036-69-3, Lithium niobium scandium phosphate (Li_{2.7}Nb_{0.15}Sc_{1.85}(PO₄)₃) 201036-70-6, Lithium niobium scandium phosphate (Li_{2.6}Nb_{0.2}Sc_{1.8}(PO₄)₃) (stabilization of superionic conduction phase in Li₃Sc₂(PO₄)₃)
 RN 190652-55-2 HCPLUS
 CN Lithium scandium zirconium phosphate (Li_{2.8}Sc_{1.8}Zr_{0.2}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
O4P	3		14265-44-2
Zr	0.2		7440-67-7
Sc	1.8		7440-20-2
Li	2.8		7439-93-2

RN 201036-54-6 HCPLUS

CN Lithium scandium titanium phosphate (Li_{2.95}Sc_{1.95}Ti_{0.05}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.05	7440-32-6
Sc	1.95	7440-20-2
Li	2.95	7439-93-2

RN 201036-55-7 HCPLUS
CN Lithium scandium titanium phosphate (Li_{2.9}Sc_{1.9}Ti_{0.1}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.1	7440-32-6
Sc	1.9	7440-20-2
Li	2.9	7439-93-2

RN 201036-56-8 HCPLUS
CN Lithium scandium titanium phosphate (Li_{2.8}Sc_{1.8}Ti_{0.2}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.2	7440-32-6
Sc	1.8	7440-20-2
Li	2.8	7439-93-2

RN 201036-57-9 HCPLUS
CN Lithium scandium titanium phosphate (Li_{2.6}Sc_{1.6}Ti_{0.4}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.4	7440-32-6
Sc	1.6	7440-20-2
Li	2.6	7439-93-2

RN 201036-58-0 HCPLUS
CN Lithium scandium titanium phosphate (Li_{2.4}Sc_{1.4}Ti_{0.6}(PO₄)₃) (CA INDEX
NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.6	7440-32-6
Sc	1.4	7440-20-2
Li	2.4	7439-93-2

RN 201036-63-7 HCPLUS
CN Lithium niobium scandium phosphate (Li_{2.96}Nb_{0.02}Sc_{1.98}(PO₄)₃) (CA
INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Sc	1.98	7440-20-2
Nb	0.02	7440-03-1
Li	2.96	7439-93-2

RN 201036-64-8 HCPLUS
CN Lithium niobium scandium phosphate (Li_{2.9}Nb_{0.05}Sc_{1.95}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Sc	1.95	7440-20-2
Nb	0.05	7440-03-1
Li	2.9	7439-93-2

RN 201036-67-1 HCPLUS
CN Lithium scandium titanium phosphate (Li_{2.4}Sc_{1.6}Ti_{0.4}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.4	7440-32-6
Sc	1.6	7440-20-2
Li	2.4	7439-93-2

RN 201036-68-2 HCPLUS
CN Lithium niobium scandium phosphate (Li_{2.8}Nb_{0.1}Sc_{1.9}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Sc	1.9	7440-20-2
Nb	0.1	7440-03-1
Li	2.8	7439-93-2

RN 201036-69-3 HCPLUS
CN Lithium niobium scandium phosphate (Li_{2.7}Nb_{0.15}Sc_{1.85}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Sc	1.85	7440-20-2
Nb	0.15	7440-03-1
Li	2.7	7439-93-2

RN 201036-70-6 HCPLUS
CN Lithium niobium scandium phosphate (Li_{2.6}Nb_{0.2}Sc_{1.8}(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Sc	1.8	7440-20-2
Nb	0.2	7440-03-1
Li	2.6	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 76

IT 87796-15-4, Lithium scandium phosphate Li₃Sc₂(PO₄)₃
 198652-55-2, Lithium scandium zirconium phosphate
 Li₂.8Sc₁.8Zr₀.2(PO₄)₃ 201036-54-6, Lithium scandium titanium
 phosphate (Li₂.95Sc₁.95Ti₀.05(PO₄)₃) 201036-55-7, Lithium
 scandium titanium phosphate (Li₂.9Sc₁.9Ti₀.1(PO₄)₃)
 201036-56-8, Lithium scandium titanium phosphate
 (Li₂.8Sc₁.8Ti₀.2(PO₄)₃) 201036-57-9, Lithium scandium
 titanium phosphate (Li₂.6Sc₁.6Ti₀.4(PO₄)₃) 201036-58-0,
 Lithium scandium titanium phosphate (Li₂.4Sc₁.4Ti₀.6(PO₄)₃)
 201036-59-1, Lithium magnesium scandium phosphate
 (Li₃.05Mg₀.05Sc₂.95(PO₄)) 201036-60-4, Lithium magnesium scandium
 phosphate (Li₃.2Mg₀.2Sc₁.8(PO₄)) 201036-63-7, Lithium
 niobium scandium phosphate (Li₂.96Nb₀.02Sc₁.98(PO₄)₃)
 201036-64-8, Lithium niobium scandium phosphate
 (Li₂.9Nb₀.05Sc₁.95(PO₄)₃) 201036-65-9, Lithium magnesium scandium
 phosphate (Li₃.1Mg₀.1Sc₁.9(PO₄)) 201036-66-0, Lithium magnesium
 scandium phosphate (Li₃.3Mg₀.3Sc₁.7(PO₄)) 201036-67-1,
 Lithium scandium titanium phosphate (Li₂.4Sc₁.6Ti₀.4(PO₄)₃)
 201036-68-2, Lithium niobium scandium phosphate
 (Li₂.8Nb₀.1Sc₁.9(PO₄)₃) 201036-69-3, Lithium niobium
 scandium phosphate (Li₂.7Nb₀.15Sc₁.85(PO₄)₃) 201036-70-6,
 Lithium niobium scandium phosphate (Li₂.6Nb₀.2Sc₁.8(PO₄)₃)
 (stabilization of superionic conduction phase in Li₃Sc₂(PO₄)₃)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE
 RE FORMAT

L25 ANSWER 48 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1997:718093 HCAPLUS Full-text
 DOCUMENT NUMBER: 128:5716
 ORIGINAL REFERENCE NO.: 128:1139a,1142a
 TITLE: Cathode materials for secondary alkali metal-ion
 and lithium-ion batteries
 INVENTOR(S): Goodenough, John B.; Padhi, Akshaya;
 Nanjundaswamy, K. S.; Masquelier, Christian
 PATENT ASSIGNEE(S): Board of Regents, the University of Texas System,
 USA
 SOURCE: PCT Int. Appl., 47 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9740541	A1	19971030	WO 1997-US6671	19970423 <--

W: CA, JP
 RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,
 PT, SE

CA 2251709	A1	19971030	CA 1997-2251709 <--	19970423
CA 2251709	C	20060801		
CA 2543784	A1	19971030	CA 1997-2543784 <--	19970423
EP 904607	A1	19990331	EP 1997-923437 <--	19970423
EP 904607	B1	20041027		
R: DE, FR, GB, IT				
JP 2000509193	T	20000718	JP 1997-538259 <--	19970423
EP 1501137	A2	20050126	EP 2004-22447 <--	19970423
EP 1501137	A3	20061025		
R: DE, FR, GB, IT				
EP 1755182	A1	20070221	EP 2006-20470 <--	19970423
R: DE, FR, GB, IT				
EP 1755183	A1	20070221	EP 2006-21083 <--	19970423
R: DE, FR, GB, IT				
JP 2007214147	A	20070823	JP 2007-128682 <--	20070514
JP 2007294463	A	20071108	JP 2007-128681 <--	20070514
PRIORITY APPLN. INFO.:			US 1996-16060P <--	P 19960423
			US 1996-32346P <--	P 19961204
			CA 1997-2251709 <--	A3 19970423
			EP 1997-923437 <--	A3 19970423
			EP 2004-22447 <--	A3 19970423
			JP 1997-538259 <--	A3 19970423
			WO 1997-US6671 <--	W 19970423

ED Entered STN: 13 Nov 1997

AB The cathode materials are LiMPO₄, where M is ≥1 1st-row transition-metal cation; Mn, Fe, Co, and/or Ni; or Fe_{1-x}Mn_x or Fe_{1-x}Tix, where 0 <x <1. The cathode materials comprise a rhombohedral Nasicon material M_{1+x}M₂(PO₄)₃, where M₁ is Li or Na and x ≤5.

IT 198782-41-1, Iron lithium phosphate (Fe₂Li₃-5(PO₄)₃)

198782-42-2, Iron lithium phosphate sulfate

(Fe₂Li₁₋₃(PO₄)₂)

(cathode materials for secondary lithium-ion batteries)

RN 198782-41-1 HCAPLUS

CN Iron lithium phosphate (Fe₂Li₃-5(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4P	3	14265-44-2	
Li	3 - 5	7439-93-2	
Fe	2	7439-89-6	

RN 198782-42-2 HCPLUS
 CN Iron lithium phosphate sulfate ($\text{Fe}_2\text{Li}_{1.3}(\text{PO}_4)_2$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4S	2	14808-79-8
O4P	1	14265-44-2
Li	1 - 3	7439-93-2
Fe	2	7439-89-6

IT 198782-44-4, Lithium niobium titanium phosphate ($\text{Li}_{10-2}\text{NbTi}(\text{PO}_4)_3$) 198782-45-5, Iron lithium niobium phosphate ($\text{FeLi}_{1.3}\text{Nb}(\text{PO}_4)_3$)
 (cathode materials for secondary lithium-ion batteries)

RN 198782-44-4 HCPLUS
 CN Lithium niobium titanium phosphate ($\text{Li}_{10-2}\text{NbTi}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	1	7440-32-6
Nb	1	7440-03-1
Li	0 - 2	7439-93-2

RN 198782-45-5 HCPLUS
 CN Iron lithium niobium phosphate ($\text{FeLi}_{1.3}\text{Nb}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Nb	1	7440-03-1
Li	1 - 3	7439-93-2
Fe	1	7439-89-6

IC ICM H01M004-58
 ICS C01B025-26

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 49

IT 15365-14-7, Iron lithium phosphate (LiFePO_4) 198782-39-7, Iron lithium phosphate ($\text{FeLi}_{10-1}(\text{PO}_4)_3$) 198782-41-1, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1.3}(\text{PO}_4)_2$) 198782-42-2, Iron lithium phosphate sulfate ($\text{Fe}_2\text{Li}_{1.3}(\text{PO}_4)_2(\text{SO}_4)_2$) 951777-58-5, Lithium sodium vanadium phosphate ($\text{Li}_2\text{NaV}_2(\text{PO}_4)_3$)
 (cathode materials for secondary lithium-ion batteries)

IT 11123-44-7 59205-70-8 198782-44-4, Lithium niobium titanium phosphate ($\text{Li}_{10-2}\text{NbTi}(\text{PO}_4)_3$) 198782-45-5, Iron lithium niobium phosphate ($\text{FeLi}_{1.3}\text{Nb}(\text{PO}_4)_3$)
 (cathode materials for secondary lithium-ion batteries)

L25 ANSWER 49 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1997:469779 HCPLUS Full-text
 DOCUMENT NUMBER: 127:97562
 ORIGINAL REFERENCE NO.: 127:18749a,18752a
 TITLE: Cathode active mass for lithium secondary batteries and the batteries

INVENTOR(S): Hikuma, Koichiro
 PATENT ASSIGNEE(S): Sony Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09171827	A	19970630	JP 1995-350114 -->	19951221
JP 3319258	B2	20020826		
PRIORITY APPLN. INFO.:			JP 1995-350114 -->	19951221

ED Entered STN: 26 Jul 1997
 AB The cathode active mass is $\text{Li}_x\text{Fe}_2\text{PO}_4$ ($0 < x \leq 1.0$). The batteries show stable discharge voltage.
 IT 192194-51-7P, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-x}\text{PO}_4$)
 (cathodes; Fe Li phosphate cathode active mass for Li secondary batteries)
 RN 192194-51-7 HCAPLUS
 CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-x}\text{PO}_4$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	1 - 2	7439-93-2
Fe	2	7439-89-6

IC ICM H01M004-58
 ICS C01B025-45; H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT 192194-49-3P, Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-x}\text{PO}_4$) 192194-51-7P
 (Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-x}\text{PO}_4$)
 (cathodes; Fe Li phosphate cathode active mass for Li secondary batteries)

L25 ANSWER 50 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1996:739822 HCAPLUS Full-text
 DOCUMENT NUMBER: 126:123873
 ORIGINAL REFERENCE NO.: 126:23831a,23834a
 TITLE: Synthesis, redox potential evaluation and electrochemical characteristics of NASICON-related-3D framework compounds
 AUTHOR(S): Nanjundaswamy, K. S.; Padhi, A. K.; Goodenough, J. B.; Okada, S.; Ohtsuka, H.; Arai, H.; Yamaki, J.
 CORPORATE SOURCE: Center for Materials Science and Engineering, University of Texas at Austin, ETC 9.102, Austin, TX, USA
 SOURCE: Solid State Ionics (1996), 92(1,2), 1-10
 CODEN: SSIOD3; ISSN: 0167-2738
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ED Entered STN: 16 Dec 1996

AB The framework compds. M₂(SO₄)₃ with M = (Ti Fe), (V Fe), Fe and LixM₂(PO₄)₃ with M = Ti, (V Fe), Fe were synthesized and electrochem. characterized by the coin-cell method. Use of larger (XO₄)_n- polyanions not only allows fast Li⁺ ion conduction in an open 3-dimensional framework that is selective for the working alkali ion on discharge; it also stabilizes operative redox potentials Fe³⁺/Fe²⁺, Ti⁴⁺/Ti³⁺, and V³⁺/V²⁺ that give open-circuit voltages Voc > 2.5 V as well as access to V⁴⁺/V³⁺, Ti³⁺/Ti²⁺, and Fe²⁺/Fe⁺ couples. Sepns. of the V⁴⁺/V³⁺ and V³⁺/V²⁺ couples are 2.0 V. Fe₂(SO₄)₃ has both monoclinic and rhombohedral modifications that give a flat open-circuit voltage Voc = 3.6 V vs. Li and a reversible capacity for apprx. 1.8 Li atoms per formula unit. LixFe₂(SO₄)₃ shows an abrupt voltage drop occurring for x > 2 that can be held in check by the addition of buffers such as Li₃Fe₂(PO₄)₃, FeV(SO₄)₃, and LiTi₂(PO₄)₃. Changing the polyanion group from (SO₄)₂₋ to (PO₄)₃₋ in these framework compds. decreases the redox potentials from 3.2 to 2.5 V for the Ti⁴⁺/Ti³⁺ couple, from 2.5 to 1.7 V for the V³⁺/V²⁺ couple, and from 3.6 to 2.8 V for the Fe³⁺/Fe²⁺ couple. Comparative advantages and disadvantages of framework cathodes for Li rechargeable battery applications are discussed.

IT 186131-68-0P, Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃)
 (synthesis and redox potential and electrochem. characteristics of)

RN 186131-68-0 HCAPLUS

CN Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
V	1	7440-62-2
Li	3	7439-93-2
Fe	1	7439-89-6

CC 72-2 (Electrochemistry)
 Section cross-reference(s): 52
 IT 10028-22-5P, Iron sulfate (Fe₂(SO₄)₃) 13701-70-7P, Vanadium sulfate (V₂(SO₄)₃) 14521-02-9P, Iron titanium sulfate (FeTi(SO₄)₃) 30622-39-0P, Lithium titanium phosphate (LiTi₂(PO₄)₃) 36058-25-0P, Iron lithium phosphate (Fe₂Li₃(PO₄)₃) 186131-68-0P, Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃) 186131-69-1P, Iron vanadium sulfate (FeV(SO₄)₃)
 (synthesis and redox potential and electrochem. characteristics of)
 REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 51 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1995:820825 HCAPLUS Full-text
 DOCUMENT NUMBER: 123:233358
 ORIGINAL REFERENCE NO.: 123:41567a,41570a
 TITLE: Secondary alkali metal battery and its electrolyte
 INVENTOR(S): Coetzer, Johan
 PATENT ASSIGNEE(S): Lilliwyte S. A., Luxembourg
 SOURCE: S. Africian, 30 pp.
 CODEN: SFXXAB
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
ZA 9201893	A	19930913	ZA 1992-1893	19920313

PRIORITY APPLN. INFO.:

ZA 1991-1900

A 19910314

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ED Entered STN: 29 Sep 1995

AB The battery has an alkali metal anode, a transition metal halide cathode, and ≥ 1 liquid electrolyte $M_xAr_pX_q$, where M is an alkali metal or a mixture of these metals; A is selected from Al, B, and/or Zn; R is an organic radical or a mixture of these radicals; X is selected from organic radicals and/or halogens; x is ≥ 1 ; p is ≥ 1 ; q is ≤ 3 ; and p + q is ≥ 4 when A is selected from Al and/or B, and ≥ 3 when A is selected from Zn and mixts. comprising Zn.

IT 91295-89-8, Lithium zirconium phosphate silicate

(Li₃Zr₂(PO₄)(SiO₄)₂)

(alkali metal battery separator)

RN 81295-89-8 HCAPLUS

CN Lithium zirconium phosphate silicate (Li₃Zr₂(PO₄)(SiO₄)₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ Si	2	17181-37-2
O ₄ P	1	14265-44-2
Zr	2	7440-67-7
Li	3	7439-93-2

IC ICM H01M

ICS C23F

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 12005-14-0, Aluminum lithium oxide (Al₅Li₈O) 12005-16-2, Aluminum sodium oxide (Al₅Na₈O) 12005-48-0, Aluminum sodium oxide (Al₁₁Na₁O₇) 12505-59-8, Aluminum lithium oxide (Al₁₁Li₁O₁₇) 58572-20-6, Sodium zirconium phosphate silicate (Na₃Zr₂(PO₄)(SiO₄)₂) 91295-89-8, Lithium zirconium phosphate silicate (Li₃Zr₂(PO₄)(SiO₄)₂) (alkali metal battery separator)

L25 ANSWER 52 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1993:655385 HCAPLUS Full-text

DOCUMENT NUMBER: 119:255385

ORIGINAL REFERENCE NO.: 119:45469a,45472a

TITLE: Lithium-containing glass-ceramics

INVENTOR(S): Hosono, Hideo; Abe, Yoshihiro

PATENT ASSIGNEE(S): Shingijutsu Kaihatsu Jigyodan, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05139781	A	19930608	JP 1991-308098	19911122

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PRIORITY APPLN. INFO.:

JP 1991-308098

19911122

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ED Entered STN: 11 Dec 1993

AB The glass-ceramics contain $Li_{1+x}Al_xTi_{2-x}(PO_4)_3$ ($0 \leq x \leq 1.0$), and are prepared by melting mixts. of Li-containing oxides and Ca₃(PO₄)₂ to form a glass,

crystallizing the glass by heat treatment, and leaching $\text{Ca}_3(\text{PO}_4)_2$ with acid. The glass-ceramics have high elec. conductivity and are suitable for use in batteries.

IT 151356-42-2, Aluminum lithium titanium phosphate
 $(\text{AlO}-\text{LiI}-2\text{TiI}-2(\text{PO}_4)_3)$
 (glass-ceramics, manufacture of elec. conductive)

RN 151356-42-2 HCAPLUS

CN Aluminum lithium titanium phosphate ($\text{AlO}-\text{LiI}-2\text{TiI}-2(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	1 - 2	7440-32-6
Li	1 - 2	7439-93-2
Al	0 - 1	7429-90-5

IC ICM C03C010-02

ICS C03C004-16

CC 57-1 (Ceramics)

Section cross-reference(s): 52

IT 151356-42-2, Aluminum lithium titanium phosphate

$(\text{AlO}-\text{LiI}-2\text{TiI}-2(\text{PO}_4)_3)$

(glass-ceramics, manufacture of elec. conductive)

L25 ANSWER 53 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1992:163310 HCAPLUS Full-text

DOCUMENT NUMBER: 116:163310

ORIGINAL REFERENCE NO.: 116:27425a,27428a

TITLE: Synthesis and electrical conductivity of vanadium bronzes by molten salt electrolysis

AUTHOR(S): Kaneko, Yoshikazu; Kojima, Hiroao

CORPORATE SOURCE: Fac. Eng., Yamanashi Univ., Kofu, 400, Japan

SOURCE: Solid State Ionics (1991), 49, 167-73

CODEN: SSIOD3; ISSN: 0167-2738

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 17 Apr 1992

AB The ionic-electronic conducting compds. of lithium vanadium bronzes, copper vanadium bronzes, and Mo doped vanadium bronzes were obtained from molten $\text{LiVO}_3\text{-V}2\text{O}_5$ system, $\text{V}2\text{O}_5\text{-Li}_3\text{PO}_4$ system, $\text{V}2\text{O}_5\text{-CuCl}$ system, and $\text{V}2\text{O}_5\text{-Li}_2\text{MoO}_4$ system by electrolysis. The electrolysis conditions were determined from the cyclic voltammograms of electrolytic bath at 650° to 800° . The mixture melts of $\text{V}2\text{O}_5$ containing 9.1 mol% Li_3PO_4 were used as the ideal composition of electrolytic bath for $\beta\text{-Li}_0.36\text{V}2\text{O}_5$ crystallization. The lithium contents of $\beta\text{-Li}_0.36\text{V}2\text{O}_5$ crystals were controlled with c.d. and composition of electrolytic bath. The crystals of $\text{Li}_{0.29}\text{V}_{1.82}\text{Mo}_{0.180}$ were obtained from electrolysis of $\text{V}2\text{O}_5$ melts containing 25 mol% Li_2MoO_4 . The activation energy of conductivity for Mo doped lithium vanadium bronzes was less than the non Mo doped bronzes.

IT 139900-33-7, Lithium vanadium oxide phosphate

$(\text{Li}_{0.24}\text{V}_0.51\text{O}_1.27(\text{PO}_4)_0.75)$

(cyclic voltammogram of)

RN 139900-33-7 HCAPLUS

CN Lithium vanadium oxide phosphate ($\text{Li}_{0.24}\text{V}_0.51\text{O}_1.27(\text{PO}_4)_0.75$) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O		1.27		17778-80-2
O4P		0.75		14265-44-2
V		0.51		7440-62-2
Li		2.24		7439-93-2

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 72, 78

IT 139900-32-6, Lithium vanadium oxide phosphate
 (L10.2V1.82O4.54(PO4)0.09) 139900-33-7, Lithium vanadium
 oxide phosphate (Li0.24V0.51O1.27(PO4)0.75) 139900-34-8, Lithium
 vanadium oxide (Li0.57V1.43O3.86)
 (cyclic voltammogram of)

L25 ANSWER 54 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:665266 HCPLUS Full-text

DOCUMENT NUMBER: 115:265266

ORIGINAL REFERENCE NO.: 115:44917a,44920a

TITLE: Intercalation in 3D-skeleton structures: ionic
 and electronic features

AUTHOR(S): Hagenmuller, Paul; Delmas, Claude

CORPORATE SOURCE: Lab. Chimie Solide, Univ. Bordeaux I, Talence,
 33405, Fr.

SOURCE: Materials Research Society Symposium Proceedings (1991), 210(Solid State Ionics 2), 323-34

CODEN: MRSPDH; ISSN: 0272-9172

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 14 Dec 1991

AB The voltage of an electrochem. cell, i.e. the difference between the chemical potentials of the two electrodes, may play the role of a sensor which allows to display the structural modifications and the phys. properties. The electrochem. processes involved in an alkali metal (A) intercalation electrode emphasize the influence of the ionic and/or electronic features. The A+-lattice and A+-A+ interactions as well as electronic band-filling may lead to phase transitions or even limit the intercalation reaction. The shape of the cell voltage vs. intercalation rate curve depends on the number of vacant sites available for intercalation, the number and the oxidation state of the reducible cations, the band structure of the material and the covalency of the framework. Alkali ion intercalation in 3D-structures related to perovskite (Ln₁/3NbO₃), hexagonal tungsten bronze (LiW3O9F) and Nasicon-type (AM₂(PO₄)₃) is discussed from that point of view. In Ln₁/3NbO₃ (Ln = La, Nd) (i.e. .box. 1/2Ln₁/3.box. '1/6NbO₃) Li⁺ intercalation in various sites is related to the rare earth size. Two extra lithium atoms can be introduced into LiW3O9F in which four sites are available, but only one out of two is occupied in order to reduce the electrostatic interactions. Moreover the change in the discharge curves can be associated to the modifications with intercalation rate of the Li⁺-lattice interactions. Within the Nasicon derived structures of ATi₂(PO₄)₃ and Fe₂(MoO₄)₃ the intercalation process is limited by the lowest stable oxidation state of titanium or iron. In both systems the strong electronic localization leads to formation of large two phase-domains. The relevance of using 3D-intercalation electrodes in electrochem. power batteries will be discussed as for factors such as elec. behavior or absence of significant unit cell modifications of the pos. electrodes during the intercalation process are essential for many cycle utilizations.

IT 119536-20-8, Lithium titanium phosphate (Li₁-3Ti₂(PO₄)₃)
 (charging and discharging of, intercalation in relation to)

RN 119536-20-8 HCPLUS

CN Lithium titanium phosphate (Li₁-3Ti₂(PO₄)₃) (CA INDEX NAME)

Component		Ratio		Component
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			Registry Number
O4P	3		14265-44-2
Ti	2		7440-32-6
Li	1 - 3		7439-93-2

CC 72-2 (Electrochemistry)

Section cross-reference(s): 78

IT 119536-20-8, Lithium titanium phosphate (Li₁-3Ti₂(PO₄)₃)119536-21-9, Sodium titanium phosphate (Na₁-3Ti₂(PO₄)₃)

(charging and discharging of, intercalation in relation to)

L25 ANSWER 55 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1991:232057 HCAPLUS Full-text

DOCUMENT NUMBER: 114:232057

ORIGINAL REFERENCE NO.: 114:39107a,39110a

TITLE: Lithium ion-conductive solid electrolyte
containing lithium titanium phosphateINVENTOR(S): Adachi, Ginya; Imanaka, Nobuhito; Aono, Hiromichi;
Sugimoto, Eisuke; Sadaoka, Yoshihiko; Yasuda, Naoshi;

Naoshi; Hara, Takeo; Nagata, Masaki

PATENT ASSIGNEE(S): Japan Synthetic Rubber Co., Ltd., Japan

SOURCE: U.S., 15 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4985317	A	19910115	US 1989-372075 <--	19890628
JP 02148655	A	19900607	JP 1988-302539 <--	19881130
JP 02148656	A	19900607	JP 1988-302540 <--	19881130
JP 02162605	A	19900622	JP 1988-315800 <--	19881214
JP 03029206	A	19910207	JP 1989-259832 <--	19891004
PRIORITY APPLN. INFO.:			JP 1988-302539 <--	A 19881130
			JP 1988-302540 <--	A 19881130
			JP 1988-315800 <--	A 19881214
			JP 1989-57367 <--	A 19890309

ED Entered STN: 15 Jun 1991

AB The electrolyte is Li_{1+x}M_xTi_{2-x}(PO₄)₃, Li_{1+y}Ti₂SiyP_{3-y}O₁₂, or a compound obtained by mixing LiTi₂(PO₄)₃ with another Li compound, where M is ≥1 element selected from Fe, Al, Sc, Y, La, and rare earth elements; x = 0.1-1.9; and y = 0.1-2.9. The electrolyte can be used in small and thin batteries in the form of a sheet of an insulating elastomer with 55-95 volume% of uniformly dispersed solid electrolyte powder. Several invention electrolytes were prepared, and their ion conductivity, Li⁺ transport number, and chemical stability are reported.IT 133340-01-9, Lithium scandium titanium phosphate
(Li₁-2.9Sc_{0.1}-1.9Ti_{0.1}-1.9(PO₄)₃) 133340-02-8, Aluminum

lithium titanium phosphate ($\text{Al}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3$)
 133340-03-1, Iron lithium titanium phosphate
 $(\text{Fe}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3)$ 133340-04-2, Lithium
 titanium phosphate silicate ($\text{Li}_{1.1-3.9}\text{Ti}_{2}(\text{PO}_4)_0.1-2.9(\text{SiO}_4)_0.1-2.9$)
 133517-12-1, Lanthanum lithium titanium phosphate
 $(\text{La}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3)$ 133741-58-2, Lithium
 titanium yttrium phosphate ($\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}\text{Y}_{0.1-1.9}(\text{PO}_4)_3$)
 (electrolytes, lithium ion-conductive, for small and thin
 batteries)
 RN 133340-01-9 HCPLUS
 CN Lithium scandium titanium phosphate ($\text{Li}_{1.1-2.9}\text{Sc}_{0.1-1.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.1 - 1.9	7440-32-6
Sc	0.1 - 1.9	7440-20-2
Li	1.1 - 2.9	7439-93-2

RN 133340-02-0 HCPLUS
 CN Aluminum lithium titanium phosphate ($\text{Al}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.1 - 1.9	7440-32-6
Li	1.1 - 2.9	7439-93-2
Al	0.1 - 1.9	7429-90-5

RN 133340-03-1 HCPLUS
 CN Iron lithium titanium phosphate ($\text{Fe}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.1 - 1.9	7440-32-6
Li	1.1 - 2.9	7439-93-2
Fe	0.1 - 1.9	7439-89-6

RN 133340-04-2 HCPLUS
 CN Lithium titanium phosphate silicate ($\text{Li}_{1.1-3.9}\text{Ti}_{2}(\text{PO}_4)_0.1-2.9(\text{SiO}_4)_0.1-2.9$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.1 - 2.9	17181-37-2
O4P	0.1 - 2.9	14265-44-2
Ti	2	7440-32-6
Li	1.1 - 3.9	7439-93-2

RN 133517-12-1 HCPLUS
 CN Lanthanum lithium titanium phosphate ($\text{La}_{0.1-1.9}\text{Li}_{1.1-2.9}\text{Ti}_{0.1-1.9}(\text{PO}_4)_3$) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Ti	0.1 - 1.9	7440-32-6
Li	1.1 - 2.9	7439-93-2
La	0.1 - 1.9	7439-91-0

RN 133741-58-9 HCAPLUS
 CN Lithium titanium yttrium phosphate (Li1.1-2.9Ti0.1-1.9Y0.1-1.9(PO4)3)
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2
Y	0.1 - 1.9	7440-65-5
Ti	0.1 - 1.9	7440-32-6
Li	1.1 - 2.9	7439-93-2

IC ICM H01M006-18
 INCL 429191000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy
 Technology)
 Section cross-reference(s): 39, 72, 76
 IT 133340-01-9, Lithium scandium titanium phosphate
 (Li1.1-2.9Sc0.1-1.9Ti0.1-1.9(PO4)3) 133340-02-0, Aluminum
 lithium titanium phosphate (Al0.1-1.9Li1.1-2.9Ti0.1-1.9(PO4)3)
 133340-03-1, Iron lithium titanium phosphate
 (Fe0.1-1.9Li1.1-2.9Ti0.1-1.9(PO4)3) 133340-04-2, Lithium
 titanium phosphate silicate (Li1.1-3.9Ti2(PO4)0.1-2.9(SiO4)0.1-2.9)
 133517-12-1, Lanthanum lithium titanium phosphate
 (La0.1-1.9Li1.1-2.9Ti0.1-1.9(PO4)3) 133741-58-9, Lithium
 titanium yttrium phosphate (Li1.1-2.9Ti0.1-1.9Y0.1-1.9(PO4)3)
 (electrolytes, lithium ion-conductive, for small and thin
 batteries)

L25 ANSWER 56 OF 59 HCAPLUS COPYRIGHT 2008 ACS on STN
 ACCESSION NUMBER: 1989:466661 HCAPLUS Full-text
 DOCUMENT NUMBER: 111:66661
 ORIGINAL REFERENCE NO.: 111:11111a,111114a
 TITLE: Synthesis using solid electrolyte
 INVENTOR(S): Yokoyama, Seiichiro
 PATENT ASSIGNEE(S): Idemitsu Kosan Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 010422589	A	19890214	JP 1987-196267 -->	19870807
PRIORITY APPLN. INFO.:			JP 1987-196267 -->	19870807

ED Entered STN: 20 Aug 1989

AB The title method involves applying a potential to an electrode catalyst comprising an electrode and metal-ion-conductive solid electrolyte, and contacting a raw material (in vapor phase) to the electrode catalyst. Thus, an electrode of K20.11Al2O3 was used for forming paraformaldehyde from MeOH.

IT 81295-89-8
 (solid electrolytes, as electrode catalyst for electrolysis)

RN 81295-89-8 HCPLUS

CN Lithium zirconium phosphate silicate (Li₃Zr₂(PO₄)₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	2	17181-37-2
O4P	1	14265-44-2
Zr	2	7440-67-7
Li	3	7439-93-2

IC ICM C25B003-02

CC 72-9 (Electrochemistry)

Section cross-reference(s): 23, 51

IT 12005-47-9 12267-44-6 58572-20-6 71211-68-2 80892-16-6

81295-89-8

(solid electrolytes, as electrode catalyst for electrolysis)

L25 ANSWER 57 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1989:123586 HCPLUS Full-text

DOCUMENT NUMBER: 110:123586

ORIGINAL REFERENCE NO.: 110:20257a,20260a

TITLE: The NASICON-type titanium phosphates ATi₂(PO₄)₃ (A = lithium, sodium) as electrode materials

AUTHOR(S): Delmas, C.; Nadiri, A.; Soubeyroux, J. L.

CORPORATE SOURCE: Lab. Chim. Solide, Univ. Bordeaux I, Talence, 33405, Fr.

SOURCE: Solid State Ionics (1988), Volume Date 1987, 28-30(Pt. 1), 419-23

CODEN: SSIOD3; ISSN: 0167-2738

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 03 Apr 1989

AB Li and Na were intercalated in LiTi₂(PO₄)₃ and NaTi₂(PO₄)₃, resp.. Despite the low electronic conductivity of the Nasicon framework the intercalation can be realized either chemical or electrochem. The electrochem. study shows the reversibility of the process and the existence of large biphasic domains in both systems. The observed phase separation reactions result from Li⁺(Na⁺) and e⁻ migration without skeleton bond breaking and recombination. The large hexagonal c-parameter of Li₃Ti₂(PO₄)₃ results from a peculiar Li ion distribution (M(1) empty, M(2) fully occupied) as shown by neutron diffraction.

IT 119536-20-8P, Lithium titanium phosphate (Li₁.3Ti₂(PO₄)₃)

119536-22-0P, Lithium titanium phosphate (Li₂.72Ti₂(PO₄)₃)

119536-23-1P, Lithium titanium phosphate (Li₁.3.3Ti₂(PO₄)₃)
 (formation of, electrochem.)

RN 119536-20-8 HCPLUS

CN Lithium titanium phosphate (Li₁.3Ti₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	3	14265-44-2

10/551,935

Ti		2		7440-32-6
Li		1 - 3		7439-93-2

RN 119536-22-0 HCPLUS
 CN Lithium titanium phosphate (Li_{2.72}Ti₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
Ti	2	7440-32-6
Li	2.72	7439-93-2

RN 119536-23-1 HCPLUS
 CN Lithium titanium phosphate (Li_{1-3.3}Ti₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O4P	3	14265-44-2
Ti	2	7440-32-6
Li	1 - 3.3	7439-93-2

CC 72-2 (Electrochemistry)

Section cross-reference(s): 76, 78

IT 119536-20-0P, Lithium titanium phosphate (Li₁₋₃Ti₂(PO₄)₃)
 119536-21-9P, Sodium titanium phosphate (Na₁₋₃Ti₂(PO₄)₃)
 119536-22-0P, Lithium titanium phosphate (Li_{2.72}Ti₂(PO₄)₃)
 119536-23-1P, Lithium titanium phosphate (Li_{1-3.3}Ti₂(PO₄)₃)
 (formation of, electrochem.)

L25 ANSWER 58 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:416602 HCPLUS [Full-text](#)

DOCUMENT NUMBER: 107:16602

ORIGINAL REFERENCE NO.: 107:2659a,2662a

TITLE: Lithium intercalation in lithium titanium phosphate (LiTi₂(PO₄)₃)

AUTHOR(S): Nadiri, Abdelilah; Delmas, Claude

CORPORATE SOURCE: Lab. Chim. Solide, Univ. Bordeaux-I, Talence,
 33405, Fr.

SOURCE: Comptes Rendus de l'Academie des Sciences, Serie II: Mecanique, Physique, Chimie, Sciences de la Terre et de l'Univers (1987), 304(9), 415-18

CODEN: CRAMED; ISSN: 0764-4450

DOCUMENT TYPE: Journal

LANGUAGE: French

ED Entered STN: 11 Jul 1987

AB Li was intercalated either chemical or electrochem. in LiTi₂(PO₄)₃. Two Li_{1-x}Ti₂(PO₄)₃ solid solns. were obtained for 0 ≤ x ≤ 0.23 and 1.72 ≤ x ≤ 2. The reversible character of the intercalation reaction shows that the 3D Nasicon skeleton maintains. Nevertheless, the large difference in cell parameters between both solid solns. suggests a strong modification in the Li site occupancy.

IT 108823-16-1P
 (preparation by electrochem. intercalation and crystal structure of)

RN 108823-16-1 HCPLUS

CN Lithium titanium phosphate (Li_{1.72-2}Ti₂(PO₄)₃) (CA INDEX NAME)

Component	Ratio	Component
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10/551,935

| Registry Number

O4P	3		14265-44-2
Ti	2		7440-32-6
Li	1.72 - 2		7439-93-2

CC 78-3 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 72, 75

IT 108823-15-OP 108823-16-IP
(preparation by electrochem. intercalation and crystal structure of)

L25 ANSWER 59 OF 59 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1982:151389 HCPLUS Full-text

DOCUMENT NUMBER: 96:151389

ORIGINAL REFERENCE NO.: 96:24769a,24772a

TITLE: Lithium anode battery

PATENT ASSIGNEE(S): Nippon Telegraph and Telephone Public Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 56162477	A	19811214	JP 1980-65972	19800520 ---
PRIORITY APPLN. INFO.:			JP 1980-65972	A 19800520 ---

ED Entered STN: 12 May 1984

AB A Li anode battery employs Li₃Zr₂Si₂P₀12 or Li₁₄Zn(GeO₄)₄ as the cathode active material and an electrolyte which is stable towards the cathode-active material and Li, Li⁺ being transported to effect an electrochem. reaction with the cathode active material.

IT 81295-89-8

(cathodes, in lithium batteries)

RN 81295-89-8 HCPLUS

CN Lithium zirconium phosphate silicate (Li₃Zr₂(PO₄)(SiO₄)₂) (CA INDEX NAME)

Component	Ratio		Component
			Registry Number
O4Si	2		17181-37-2
O4P	1		14265-44-2
Zr	2		7440-67-7
Li	3		7439-93-2

IC H01M004-58; H01M004-38; H01M006-16; H01M010-40

CC 72-3 (Electrochemistry)

IT 70780-99-3 81295-89-8

(cathodes, in lithium batteries)

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(FILE 'HOME' ENTERED AT 13:46:14 ON 15 SEP 2008)

FILE 'HCAPLUS' ENTERED AT 13:46:20 ON 15 SEP 2008
 L1 1 SEA ABB=ON PLU=ON US20060216611/PN
 SEL RN

FILE 'REGISTRY' ENTERED AT 13:46:49 ON 15 SEP 2008
 L2 0 SEA ABB=ON PLU=ON E1-R51
 L3 51 SEA ABB=ON PLU=ON (12190-79-3/B1 OR 782495-23-2/B1 OR
 782495-24-3/B1 OR 782495-25-4/B1 OR 782495-26-5/B1 OR
 782495-27-6/B1 OR 782495-28-7/B1 OR 782495-29-8/B1 OR
 782495-30-1/B1 OR 782495-31-2/B1 OR 782495-32-3/B1 OR
 782495-33-4/B1 OR 782495-34-5/B1 OR 782495-35-6/B1 OR
 782495-36-7/B1 OR 782495-37-8/B1 OR 782495-38-9/B1 OR
 782495-39-0/B1 OR 782495-40-3/B1 OR 782495-41-4/B1 OR
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 782495-48-1/B1 OR 782495-49-2/B1 OR 782495-50-5/B1 OR
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 782495-54-9/B1 OR 782495-55-0/B1 OR 782495-56-1/B1 OR
 782495-57-2/B1 OR 782495-58-3/B1 OR 782495-59-4/B1 OR
 782495-60-7/B1 OR 782495-61-8/B1 OR 782495-62-9/B1 OR
 782495-63-0/B1 OR 782495-64-1/B1 OR 782495-65-2/B1 OR
 782495-66-3/B1 OR 782495-67-4/B1 OR 782495-69-6/B1 OR
 782495-70-9/B1 OR 782495-72-1/B1 OR 782495-74-3/B1 OR
 782495-76-5/B1)

L4 3811 SEA ABB=ON PLU=ON ((LI(L)P(L)O(L)(TI OR V OR CR OR MN OR
 FE OR CO OR NI OR CU OR ZR OR NB OR MO OR RU OR AG OR TA
 OR W OR PT OR AU))/ELS
 L5 49 SEA ABB=ON PLU=ON L4 AND L3
 L6 2 SEA ABB=ON PLU=ON L3 NOT L5
 L7 521 SEA ABB=ON PLU=ON L4 AND 2-7/LI
 L8 3655 SEA ABB=ON PLU=ON L4 AND O>=2
 L9 3102 SEA ABB=ON PLU=ON L4 AND 3.5-8/O
 L10 2942 SEA ABB=ON PLU=ON L9 AND 0.01-1/M
 L11 476 SEA ABB=ON PLU=ON L7 AND L9 AND L10

FILE 'HCAPLUS' ENTERED AT 14:08:10 ON 15 SEP 2008
 L12 6 SEA ABB=ON PLU=ON L5
 L13 3588 SEA ABB=ON PLU=ON L4
 L14 201 SEA ABB=ON PLU=ON L13 AND SOLID ELECTROLYT?
 L15 1 SEA ABB=ON PLU=ON L14 AND L1
 L16 85 SEA ABB=ON PLU=ON L14 AND DEV/RL
 L17 59 SEA ABB=ON PLU=ON L16 AND (1840-2003)/PRY,AY,PY

FILE 'HCAPLUS' ENTERED AT 14:22:27 ON 15 SEP 2008
 L18 1 SEA ABB=ON PLU=ON L12 AND (1840-2003)/PRY,AY,PY
 L19 59 SEA ABB=ON PLU=ON L17 OR L18

FILE 'REGISTRY' ENTERED AT 14:23:18 ON 15 SEP 2008
 L20 49 SEA ABB=ON PLU=ON L3 AND L11
 L21 473 SEA ABB=ON PLU=ON L11 AND TIS/CI

FILE 'HCAPLUS' ENTERED AT 14:34:41 ON 15 SEP 2008
 L22 210 SEA ABB=ON PLU=ON L21
 L23 4 SEA ABB=ON PLU=ON L22 AND L19

10/551,935

L24 117 SEA ABB=ON PLU=ON L22 AND ELECTROCHEM?/SC, SX
L25 59 SEA ABB=ON PLU=ON L24 AND (1840-2003)/PRY, AY, PY
L26 1 SEA ABB=ON PLU=ON L25 AND